SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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I am, Sir, yours truly, J. ASHCROFT, Chief Engineer.

Mr. John Bell, Asbestos Works, London. Portsmouth, February 20, 1883.

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Yours faithfully, (Signed) J. H. CUNDALL, Works Manager.

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Mr. John Bell, 118, Southwark-street, S.E.

DEAR SIR,—I have much pleasure in saying that the Asbestos Yarn and Soapstone Packing gives every satisfaction; indeed, better than we expected. We have a locomotive packed with it, and has been running five months (and think of the piston speed with our small wheels). I think the Soapstone a great improvement, as it keeps the packing elastic, and prevents it getting hard. I am very pleased with its working, and also the very low price for such good lasting packing. The Asbestos Yarn we find is very useful, and answers admirably.

(Signed) Yours truly, W. WILLIAMS.

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John Bell, ESQ.

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I remain, Sir, yours truly,

W. W. PROPHET, Chief Engineer S.S. "NORFOLK."

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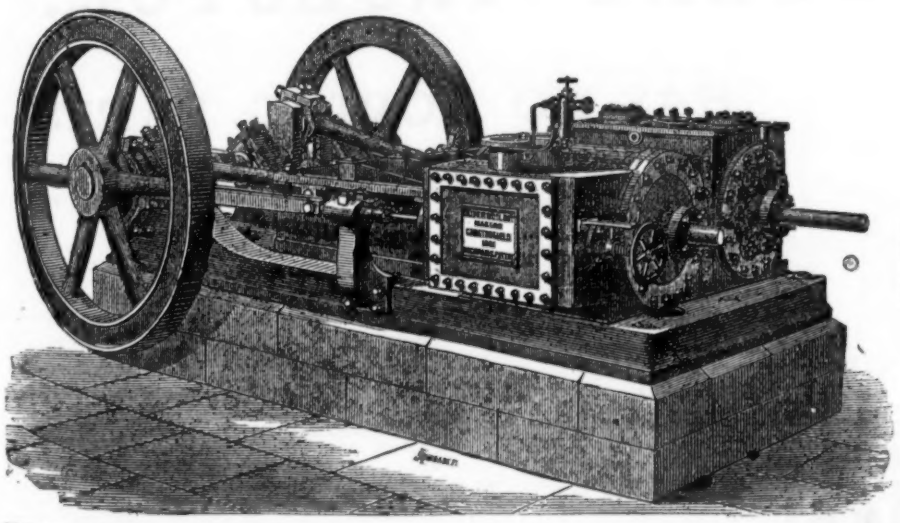

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"Herberton Advertiser" Office, Herberton, September, 1882.

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CONTINUOUS JIGGING MACHINERY.

The chief part of the paper on this subject read at the meeting of the Mining Institute of Cornwall on April 24 by Mr. Philip Argall, manager of the Duchy Peru Mines, was a *résumé* of the manner of and inventions and patents taken out in jigging from the earliest times, with a minute description of the working of the various machines referred to in such patents. In conclusion, Mr. Argall said it was a recognised principle in ore-dressing to get out all the pure ore in as large grains as possible, returning the concentrated dredge or mixed ore to be reduced to a finer state, preparatory to retreatment. To reduce all the ore to this fine state of division in the first operation meant a loss of ore as slimes and a loss of power. Assuming that in the present system of tin-dressing the tin occurred in comparatively rough grains, and the ore was stamped to pass through grates, the holes in which corresponded to the average size of the grains of tin ore, there would be no difficulty whatever in classifying and jigging this material direct from the stamps, the concentrated ore going direct to the tin-house or calciner, and the dredge being returned to a small stamps or pulveriser to be further reduced. Supposing the tin occurred in very fine grains, as in the mines of this district, it was highly, probable that by stamping through, say No. 20 grate, and jigging the material, a large quantity of the waste containing no tin or not sufficient to pay extraction would be at once got rid of, and at a very small cost. The resulting hutchwork would then be passed through the ordinary stamps, and re-jigged or buddled in the ordinary way as found most convenient. It was too much to expect that our mines would rush from one extreme to the other, and dispense with buddles in favour of jigging machinery. It was hoped, however, that some of the mines would put up a small jigging plant to treat the rough grain tin direct from the stamps; the system, by reason of its intrinsic merit, would gradually work its way through the various intermediate sizes to the very finest grain tin. He was not prepared to admit as a whole the statement that Cornwall was greatly behind the rest of the world in dressing machinery. The Cornish dressing plant, though it did not on first sight look as imposing as some of the patent systems before the public, on careful examination, would be found strong and substantial, and to answer the purpose it was intended for, though probably not dressing the ores as cheaply as modern machinery. Very few Cornish mines were brought to the ground by erecting expensive and elaborate, though comparatively untried, dressing machinery—a remark that would not equally apply to many other mining districts. Cornishmen had also to a great extent contributed to the continuous dressing plants. The Cornish buddle, crusher, and many other inventions had been invented and brought to their present efficiency in the county; the hydraulic jigger was invented in Germany and Cornwall almost simultaneously, but was comparatively ignored in this county while the Germans were bringing it to a very efficient state. If the continuous jigging system were now introduced and properly taken up by our mining men, the next decade would see a greater revolution in ore dressing than any previous one.

The discussion having been formally opened by the President—Mr. J. Henderson, C.E.—many valuable observations were elicited. Capt. Teague, sen., admitted tin mines were behind in their dressing operations, but questioned the applicability of the jigging machines referred to by Capt. Argall to those mines. A mine or two had introduced jigging machines for the purpose of cleaning tin, and those machines had not answered satisfactorily, either as regarded economy or extraction of tin. Wheal Jane was one of the tin mines at which jigging machines were used, Whether the system of stamping in those cases was as it should be he did not know, but something was at fault. Capt. Teague proposed a vote of thanks to Mr. Argall for his paper.—Mr. Frecheville, H.M. Inspector of Mines, said the paper was perfect in bringing us from the earliest system of jigging ores down to the modern inventions on the subject. Tin jigging was practised at Wheal Jane, as Mr. Teague had said, but the machines were there placed in a very unsatisfactory manner. The material was discharged into the jiggers without any classification, and under such conditions there could be no perfect dressing with a jigger or any other machine. In Germany silver ores—which ores everyone with a practical experience in the dressing of material knew were the most difficult to dress—were generally sorted by hand, and from the hand sorting went into the stamps, from which they were passed into boxes. From those boxes the heavier portion of the ore went direct to jiggers, which made a stroke varying from 10 millimetres to 20 millimetres, and worked at from 130 strokes to 180 strokes per minute. The jiggers had sieves at the bottom, with half millimetre holes for the first sieve and millimetre holes in the other compartments, and passed over beds of ragging of the same specific gravity as the ores it was intended to separate. On the other hand, the finer portion of the ore was dressed in buddles, and on frames somewhat similar to Cornish frames. If a combination of jigging and buddling would answer in silver mines he could see no reason why if introduced into Cornish mines preceded by classification, it could fail to give satisfactory results

IMPROVED HOIST KEPS.—An improved hoist has been designed by Mr. John Stones, of Ure Mill, Ulverston. Revolving shutters or sliding doors form the sides of the cage or hoist, and are made to coil above automatically. When the cage is down the shutters are coiled on their respective rollers above the opening, and immediately the hoist begins to ascend or descend the shutters ascend or descend, and close the openings before the cage is clear of them. When the cage reaches the floor at which a stoppage is desired the sliding-doors are lifted above or below the openings. The cage is thus completely closed except when it is on a level with the floor, at which it stops, and thus the dangers caused by the hoists at present in use having doors which shut by hand, and which are liable to be left open, with resultant loss of life or limb are entirely obviated. In case of fire Mr. Stones's hoists would form a most reliable escape, as the shutters could be constructed of iron if necessary; and supposing the upper part of a building where such a hoist was used were in flames, the cage with its iron sides could carry those endangered through the burning storeys in perfect safety, while the hoist might be passed from one floor to another with great expedition for the rescue of those who might be dispersed throughout the building. The invention can be applied to any number of openings on the same or different floors. The apparatus can be worked by hydraulic, steam, gas, or hand power, and the shutters may be applied to one side or all the sides of the cage.

STEAM YACHT FOR MISSIONARY WORK.—The first sea-going steam vessel used by the Church Missionary Society, was tried at the measured mile on April 28, and attained 11¾ miles per hour for five consecutive hours. The Henry Wright is a handsome memorial to the Society's late secretary, whose name it takes. The dimensions are:—Length between the perpendiculars, 80 feet; beam 16 feet depth of hold, 8 feet 6 in.; draft of water with steam up, 7 feet 3 in. and she is composite built of teak, coppered, and copper fastened and classed at Lloyds for 19 years A 1. The machinery is of the most modern and improved design, and as there are no dry docks or engineers shops as yet at Zanzibar, it was necessary that everything connected with the vessel should be of the very best quality. The order was given to the eminent firm of Messrs. R. and H. Green, Blackwall-yard, who entrusted the construction of the machinery to Messrs. Alex. Wilson and Co., Vauxhall Ironworks, Wandsworth-road.

Original Correspondence.

LAKE SUPERIOR MINING—OSCEOLA AND ATLANTIC.

SIR,—In the Journal of March 24 Mr. R. Meikle asks for an explanation of the excessive cost of mining at the Osceola Consolidated Mine for the year 1882. The basis on which Mr. Meikle figures is incorrect, for the rock does not yield 2 per cent. of copper. Below I append some particulars, which if not before furnished will afford the information sought. The gross receipts (1882) for copper, silver, &c., were $749,222·76; the expenses at mine, $459,636·78; and other expenses, smelting, transportation, insurance, &c., $87,148·70; making cost of copper, $541,785·48; and leaving a profit of $207,437·28.

The total amount of rock hoisted was 205,658 tons; disconded, poor, 33,129 tons; stamped, 172,529 tons; product of mineral (86·814 per cent.), 4,811,241 lbs.; of ingot or refined copper, 4,176,782 lbs. The yield of refined copper per fathom of ground broken was 365½ lbs.; the percentage of refined copper in ground broken, 1015; and the cost per ton of mining, hoisting, breaking, transporting, stamping, and washing stamp rock, $26,676. The yield of ingot being slightly above half that Mr. Meikle assumed, it follows that the cost of manipulating rock bears about the same proportion.

In 1882 some of the principal items of expenditure footed up as follows:—Shafts sunk 976·2 ft., at $15·47 per ft., $15,109·60; winzes sunk 1250·1 ft., at $12·26 per ft., $15,333·60; levels drifted 6059·4 ft., at $8·31 per ft., $50,407·72; ditto, 277·6 ft., at $8·54 per ft., $2372·50; stoping 8984 fms., at $10·10 per fm., $90,804·61; ditto, 653·68 fms., at $13·70 per fm., $8959·75; transportation of rock to mill (31·19 c. per ton), $53,823·42.

The expenditures in each department of work were distributed proportionately as follows:—Mining, breaking, and delivering rock on surface, 0·62371; assorting and breaking, rock house work, 0·05201; transporting rock to mill, 0·11695; stamping and washing, 0·15923; incidentals, taxes, insurances on mine plant, &c., 0·01745; surface, 0·01149; office, 0·01416=1.

The lode on which the Osceola is at work is exceedingly bunchy, necessitating a large expenditure for opening work. The Atlantic Mine makes better figures on account of greater regularity and width of lode, and these are really extraordinary, taking into consideration the rate of wages current.

I append some figures relating to this mine. The net value of the product for 1882 (including $3855·67 balance of interest account) was $460,137·52, and the net operating expenses were $362,179·49, showing a profit for the year of $97,958·03. The summary of results shows—Rock stamped, 189,800 tons; product of mineral, 3,768,540 lbs.; product of refined copper, 2,631,708 lbs.; yield of refined copper per cubic fathom of ground broken, 259 lbs.; yield of rock treated, 13·866 lbs. copper per ton, or ·693 per cent.; gross value of product per ton of rock treated, $2·40½; cost per ton of mining, selecting, and breaking, including taxes, all surface expenses, and construction account, $1·18¾; cost per ton of transportation to mill, 1¼ c.; cost per ton of stamping and separating, 37 c.; cost per ton of freight, smelting, and marketing product, including New York office expenses, 30 c.; total expenditure per ton of rock treated, $1·90¾; net profit per ton of rock treated, 49½ c.; profit per ton of rock, including interest earned, 51½ c. J. DANIELL.

Opechee, Michigan, April 10.

MINING IN SOUTH AUSTRALIA.

SIR,—I have not sent you any letter for some time past, as there has been nothing of special interest to communicate. The progress reports of the various mines at work appear from time to time in your columns extracted from the local papers. The long-continued depression in the copper market is not calculated to encourage mining enterprise; nevertheless, there are not wanting signs of a revival of that enterprise amongst us. Several new and valuable discoveries have been made during the past few months, and some of them are in course of development, though mining generally is not carried on with that spirit which one would like to see. The discoveries of the past 12 months show that we have not yet come to the end of our mineral wealth, and, indeed, go far to prove that our mineral treasures are far greater than a few years ago we had any idea of.

The Corporation of South Australian Copper Mines is doing good work for the colony, and I believe also for its shareholders. Mr. T. A. Masey, the energetic visiting director from London, is returning home after spending over two years in the colony, and from the experience gained and the opinion he has formed in reference to South Australian mines, it is likely a great deal of good will result from his visit. Mr. Masey is a Fellow of the Geological Society, and has had a good deal of practical experience in mining, so that his opinion is worth something. He will, no doubt, be able to give a very satisfactory and encouraging account to the shareholders of their prospects here. He has just purchased the Yelta Mine, adjoining the Moonta on the north. This mine was worked for some years with but indifferent success, though some very good ore was raised, but not in sufficient quantities to pay the heavy expenses incurred in opening the ground. I have always held the opinion that this mine would prove richer in depth, and the new proprietary will have the opportunity of testing the correctness of this opinion by carrying on the workings deeper than their predecessors, while they will have the advantage of commencing where the former adventurers left off, and thus saving a very large outlay for preliminary and dead work. The diamond drill might probably be employed with advantage to test the ground at greater depths, and I should not be surprised if the Yelta Mine ultimately proved a very valuable property. A large area of mineral land has recently been taken up around the Moonta and Hamley Mines, which are proving exceedingly productive at the lowest levels—220 fathoms in the Moonta—which is encouraging for those who are in the same run of lodes, even though they have not got payable results at 20 fathoms from surface.

The two great northern mines, Blinman and Mount Rose, belonging to the Corporation, continue to show good results. In Masey's (main) shaft, at Blinman, at the 60 fathom level south the lode is worth 3 tons of 21 per cent. sulphide ore per fathom, and at the same level north a branch of rich yellow sulphide, coated black, has been cut in stoping. In its rough state it has assayed 38 per cent. of fine copper. As soon as it can be done a winze will be sunk on this branch of ore. Other parts of the mine are looking well. The dressing machinery has turned out during the week 10 tons 21 per cent. ore, and 2 tons 38 per cent. sulphides.

At the Mount Rose Mine, at the 23 fm. level north-east of the engine-shaft, the lode has yielded 1½ ton of 35 per cent. ore per fm. In driving south-west the lode yields 2 tons of 40 per cent. ore per fathom. In the 13 fm. level, east of No. 2 winze, there is a fine bunch of ore, worth at least 3 tons to the fathom of 45 per cent.; this work is let at 4*l.* 5s. per fathom: 44 tons of rich ore have been dressed and sent away during the month; 25 tons of 40 per cent. ore have been broken out, and there are 20 tons on the floors. The water is increasing. There has been some hitch in connection with the Willouran Copper Mine, north of Farina, but it is now going on again satisfactorily. The original manager sent down exaggerated reports of the size and productiveness of the lode, but as he did not forward much ore, and seemed to satisfy himself with the knowledge that it was on or in the mine, the directors appointed another agent, who from the first condemned the mine. His adverse reports were so diametrically opposed to those of everyone else who had seen the mine that suspicion was excited, and it was ascertained that he had wilfully deceived the directors by sending down a quantity of poor stuff, which he had bagged, instead of a parcel of 18 per cent. ore, which he was ordered to send, at the same time giving the directors to understand that he had sent what they required. He also filled up the drive with rubbish, where there was a good lode of ore, and declared it was all worked out. He was recalled, and two of the original miners sent back when they discovered the deceit which had been practised. They are now getting ore of 25 to over 30 per cent. where the other man said there was none. In the meantime the false report of the mine has had a most adverse and depressing effect generally on mining in the North, and business of all kinds being dull, and money scarce just now, it will be some time before it recovers. The price of shares fell in four days from 5*l.* to 5s. each, and are now even lower still, but the latest accounts from the mine are more encouraging, and from having myself seen a fine show of ore on the surface for over 4 miles in length and in a small shaft sunk to a depth of 6 fms. on the lode, I have no doubt the mine will prove a good one. The whole of the country in the neighbourhood for miles shows strong indications of being rich in copper. The extension of the railway from Farina 32½ miles farther to Hergott Springs, is progressing rapidly, and as the line will run within 8 miles of Willouran Mine a great saving in cartage will be effected.

A splendid discovery has been made lately a few miles from Beltana and the railway. It has been named the Victory Mine, and several tons of ore of 40 to 45 per cent. have been sent down. Another discovery has been made in the hills about 13 miles south-east from Adelaide and 10 miles from Mount Barker. Peacock sulphides of copper with mundic have been found within 6 ft. of the surface, but probably the present surface is many fathoms below the original surface, the denudation of ages having changed the features of the country entirely from what they were when the lode was formed. The ore is good, but at present is only found in small quantities mixed with mundic. The gold mines in the neighbourhood of Woodside seem likely to establish the character of the colony as a gold producing country, and although no very grand results have as yet been obtained there has of late been a steady improvement noticeable, and the mines give promise of proving permanent and remunerative in the future. We are unfortunately not yet in the possession of the best appliances for saving the gold, or extracting it from pyrites and other refractory combinations. If we had the means of extracting and saving 90 per cent. of all the gold existing in the stone we could point to many very payable quartz reefs. Some of the gold mines and tin mines also in the Northern Territory have lately been giving excellent results, and mining in that portion of the province is looking up.

In the North-Eastern district also, among the "Barrier Ranges," near the New South Wales boundary, very valuable discoveries of silver with galena have lately been made; as much as 140 ozs. of silver to the ton have been found. The particular localities are Umberumberka and Thackeringa, and several claims have been taken out. It is in contemplation by the Government to extend a line of railway in that direction, so as to take the south-west border of Queensland and the north-west border of New South Wales, in which case a valuable mining district might be opened up though the railway would be constructed rather with a view to the transport of stores and stock to and from stations in the interior than to help the new mining district. J. B. AUSTIN.

RAMBLES IN MANITOBA.

SIR,—In my letter of Feb. 14, 1883, which was published in the Journal of March 10, I am made to say—"You can get 820 acres of land for $20." It should be 320 acres—that is, you can take up that much for $20, but you will have to pay at the end of three years, when you get your patent, about $2 an acre for 160 acres or the pre-emption claim. There is a new land law established in Canada. I hardly know whether it will become law, and, when I say established, I hardly know whether it is established. As Bret Harte says—

Sometimes, perhaps, you can't almost tell,
Perhaps Little Johnny has gone to —— Heaven.

So you see, that what people think and what is may not be always so. But, at any rate, with regard to the Land Bill, or Land Law, it is in the hands of Sir John A. McDonald, the Premier of Canada, and what we say in Canada is this, As soon as he wants to do a thing he can do it. But there is no use of talking about law or about land. What you want to hear, and what you want to print, is about mining.

Now, the building of the Ontario and Quebec Railway between Toronto and Ottawa is opening up a new section of country. Of course the Hon. Timothy Parden, Minister of the Crown and Commissioner of Crown lands for the Province of Ontario, does not seem to care. Elected for Sarnia, brought up and made up, with regard to all his political career by Sarnia, and the success around there, he does not care for mining. Why should he care for mining? Yet, on the Holdington Road on the Hastings Road, in cuttings that to-day the contractors are just "bursting on," to use an American expression, there will be found mines of silver and of lead. Argentiferous galena that will astonish the eyes of the world, and make even the fair fame of the Comstock Mine, in Nevada, to become dim before the silver wealth of Canada. Again, there is a new silver-lead sett on Lake Temiskweneaugnui. But my letter is like Artemus Ward's speech. I don't know that I have rambled in Manitoba at all. BOURNONITE.

MINING PROGRESS IN BRAZIL.

SIR,—The Journal of Feb. 10 has a most sensible article on gold mining, which is more to the point than all the "where shall we look for our gold supply" letters. The writer on our gold supply found employment and decided to remain in the country which had received wholesale condemnation at his hands. His correspondence stopped short, without giving us the promised valuable information as to where we should look for gold. I shall watch his career in Southern Minas. The new features in this part of Minas are the completion of purchase of the Passagem and Borges Mines by the parties who have been prospecting them for two or three years past. No effort has been spared by certain parties here and in Europe to defeat this enterprise. Purely philanthropic motives have (so they say) actuated these persons. One "sieur" wishes to protect foreigners from loss, as well as to guard the natives against false hopes. Some person as late as the month of February took pains to call on one of the Paris syndicates for the avowed purpose of discouraging any further work in these mines, stating that they were in the hands of a "faiseur." Even after the syndicate had an engineer of eminence, in whom they had, and still have, full confidence, both in his integrity and ability, resident at the mines 10 months, during which time he milled ore, and directed all the engineering work. After a special examination had been made (July and August, 1882) by an engineer sent out from the house of Messrs. John Taylor and Sons, London, whose reports they fully endorse, and who had three mills at his disposal, working, as he did, six weeks in the examination of the mines and treatment of the ore. After the results in gold bars from the treatment in Brazilian mills of more than 2000 tons of ore—after all this, these "persons" volunteer information which is directly contrary to proved facts.

One person made a special visit to a well-known banker in Paris to prove that these mines are worthless, and to warn this king of operators in large and sound undertakings that he had fallen into the hands of a designing schemer. The assurance of this man is admirable, superb, his efforts are worthy of a better cause. The sequel to that visit is yet to come. I could scarcely believe that a person in the employ of the Imperial Government, or of the Province of Minas, who is employed especially in the mining department, would attempt to discourage mining enterprise in Brazil, but I cannot otherwise construe a letter which he wrote in answer to enquiry made respecting a property which he had never seen. The letter I have read. He was not paid for his opinion. He made no charge.

One word about the facts of this affair. The Paris syndicate know all about the cost of property. They have spent money freely in opening and working the properties. They have not asked the public to subscribe and pay them a profit, they have investigated the value of the mines step by step very thoroughly, and from the vigour with which work is being prosecuted—mill building and mining—they are apparently satisfied.

Three large properties have passed from the hands of the original owners—Passagem, Raposos, and Borges. The sellers do not complain, the buyers have made no sign of discontent. All the people here are well pleased to get work. I have heard expressions of extreme gratification, from the President of the province down to the poor black. The opposition to this enterprise is getting to be known, and it may soon be fully understood. Understand I am not endorsing any scheme, nor am I ready to say that all these mines will prove equal to what the St. John del Rey's Morro Velho Mine has been, but certainly the prospects are good, and all the work shows improvement.

The Dom Pedro Mine, Morra St. Anna, is in a dilapidated condition. The brilliant genius who conceived the idea of a big water-wheel was eclipsed by the one who followed with steam machinery—"Died of machinery." There is little doubt but that this is still a good mine. Without plenty of working capital, however, it will be of no use to resuscitate it. St. John del Rey's Morro Velho Mine nothing new. Mr. John Schofield stated, in a letter published on Nov. 16, 1882, in the *Mining Journal*, that the returns from the Morro Velho Mine were "gradually improving, and that there were unmistakeable evidences that the June, 1883, dividend would be from 10 to 20 per cent., and that the 'large wheel' was expected to be at work that month"—November. There will be no per cent. for dividends, and the "large wheel" is not yet finished, nor will it be for months to come. The Cuiaba Mine is worked at a loss. I predict that there will be no gain in treating tailings. The late reduction officer has been discharged, it is said, because he had occasionally used the company's servants in his house or garden. It is also said that the officers have practised this to a considerable extent for a long time back, and in this instance it is a case of the pot calling the kettle black. The secret history of this once powerful company would be interesting. Railway work is going on properly. A contract is about to be let to connect Ouro Preto with the Dom Pedro Legundo Road; money all provided by the Imperial Government. There is also some talk of building the telegraph to Diamantura.

Raposos, April 2. MINAS.

COMFORT FOR SHAREHOLDERS IN INDIAN GOLD MINING COMPANIES.

SIR,—If you would print the accompanying "Annual Progress Table," extracted from the report of the Javali Gold Mining Company in Nicaragua, you would be doing an act of kindness to shareholders in Indian companies:—

ANNUAL PROGRESS TABLE.

Year.	Ore Crushed. Tons.	Gross Realised. £	Expenses. £	Net Realised. £ s. d.	Per Ton Crushed. Working Expenses. s. d.	
1873	8,850	7,483	7,566	16 11	17 1	— 0 2
1874	10,967	10,404	9,281	19 0	16 11	+ 2 1
1875	14,550	13,253	10,864	18 2	14 11	+ 3 3
1876	17,598	14,274	10,534	16 3	12 0	+ 4 3
1877	20,370	14,347	11,152	14 1	10 11	+ 3 2
1878	21,438	16,583	12,339	15 6	11 6	+ 4 0
1879	20,909	12,481	12,740	11 11	12 2	— 0 3
1880	20,636	12,751	11,382	12 2	11 0	+ 1 2
1881	27,232	15,415	14,248	11 2	10 6	+ 0 8
1882	25,112	14,561	14,285	11 5	11 4	+ 0 1

— = loss on working, + = gain on working.

This shows that even under very adverse circumstances in respect of cost of freight and labour 3 dwts. of gold recovered per ton of ore (11s. 6d.) is sufficient not only to pay current expenses, and the cost of keeping the mine and machinery in first rate order, but also to pay for a considerable amount of additional machinery and of underground exploration. H.

THE READWIN AMALGAMATION PROCESS IN INDIA.

SIR,—Allow me space for extract from a letter received by me on the 1st inst. from Mr. Arthur Madge, F.C.S., dated Colar Gold Mines, April 9:—

I have no doubt you have been expecting ere this to have heard from me regarding my work out here with the pans and your prepared mercury. I should long ago have sent you a report of their work had I been in a position to do so, but on my arrival here, instead of finding 300 or 400 tons of gold quartz on the bank ready for me to amalgamate as soon as I had the pans ready, I found that there was nothing for me to do. I have, therefore, only been able to do about 50 tons of stuff (called mullock) that had already been picked over, and was considered useless; and I have got as much gold as the Elephant stamps gave with 50 tons of the picked stuff, including some quartz containing visible gold. With the exception of men who of course praise the Elephant, the agents out here speak well of the pans, and say they are the best amalgamators in the field. They would not use them for quartz as they are slow, but for blanket-sand and tailings most of them wish they had some of them to use. I have 30 pans here in place.

I am induced to forward this information, inasmuch as it has come to my ears that certain persons state that my amalgamation process has failed in India and America, when the reverse of this is undoubtedly the fact. T. A. READWIN, F.G.S.

London, May 2.

CHILE GOLD MINE

SIR,—"Junius Junior" in last week's Journal gives much plain and practical advice, which it is to be hoped the shareholders will profit by. The Chile is undoubtedly a very rich mine, and with proper management on the part of the board it would figure in the dividend-paying list. Much, however, rests with the shareholders themselves, who should insist upon the board being reorganised without delay, and appoint directors who are able and willing to give proper attention to the interests of the shareholders.

With a competent and energetic board of directors, and under the supervision of such an able and experienced manager as Mr. Nicholson, grand results would soon be obtained. It is probable that only a few as yet have any idea of the wealth contained in the Chile Mine, and if the shareholders are fortunate enough to obtain the co-operation of energetic directors, they may look forward to a highly prosperous career, but there must be no delay in issuing reports and statements of accounts, and the returns should be systematically made public as soon as possible after the telegram has reached the company's office.—*Salisbury, May* 1. HISTORICUS.

CHILE GOLD MINE.

SIR,—There is internal evidence in the letter of your correspondent, "Junius Junior," referring to the management of the Chile Gold Mining Company, that he is not so ignorant as he effects to be respecting "as to what has become of the 66,000*l.*" Being "one of the original shareholders" he must have some sinister design for the *suppressio veri* as to the fact that the Chairman at the annual meeting last July frankly told the shareholders that the working expenses at the mine cost on an average 4000*l.* per month. Had he, in reply to "O. S.'s" letter, pointed out this fact, and also that the interest on the 10 per cent. bonds had to be paid out of it, it would have been a more honourable and straightforward course.

No doubt all of us will be very glad when the Chile "figures in the dividend-paying list," but *bona fide* investors will fail to see the justice or the integrity of the strictures passed upon the directors. The strictures and the *suppressio veri* are in harmony, and smack very strongly of "one of the tricks of the trade." Personally I do not know a single director; but as a holder of over 4000*l.* worth of stock in the Chile I shall support the directors at the coming annual meeting, in spite of the unwarrantable aspersions of "Junius Junior."

Driffield, May 1. GUAYANA.

THE CAPE COPPER COMPANY.

SIR—As the balance-sheet of this company is always made up to April 30, it may interest the shareholders and some of your readers to have placed before them a few figures which may assist them in forming an opinion on the position and prospects of this company in anticipation of the annual report, which will not in ordinary course be issued for two months. For the year 1881 the net profits amounted to a trifle under 132,000*l.*, to which was added the balance of 26,000*l.* brought forward from the previous year, giving a total sum of 158,000*l.* divisible in respect of a capital of 140,000*l.* Out of this sum 36,000*l.* was appropriated to income tax and the several reserve funds, and 100,000*l.* was paid in dividends and bonus at the rate of 5*l.* per share, leaving 22,000*l.* to be brought into the present year's accounts. The profit of 132,000*l.* was realised by sale of ore of the gross value of 325,000*l.* at an average price of 12s. 11d. per unit. These figures will enable us to form a pretty good estimate of the results of the past year's workings.

The quantity of ore raised has been about the same, but the average price obtained per unit has been 13s. 6d., as against 12s. 11d., and that without any increase of cost. We may therefore reasonably estimate the net profits for the year at 150,000*l.*, which, with the balance brought forward, will give the directors at least 170,000*l.* to deal with. This sum will admit of the payment of a bonus of 2*l.*

in addition to the quarterly dividends of 1*l.* per share, and after placing 30,000*l.* to the several reserve funds there will remain a sum of 20,000*l.*, or 1*l.* per share, to be carried forward. If the above estimates are correct, and I believe they are, the shareholders may well be congratulated.—*City, May* 3. W. H. B.

CAPE COPPER MINING COMPANY.

SIR,—The information desired in the last issue of the Journal by "Enquirer" in respect of the apparent discrepancy between the monthly exports of copper ores from the Cape Colony, and the monthly returns of ore from this company's mines, is, in the opinion of another shareholder, easily given. The explanation is that the latter, amounting to about 1344 tons a month, are not necessarily shipped from the colony in the same month, owing frequently to the delay in the arrival or dispatch of ships, according to season. It may so happen, for instance, that in one month only a small quantity of ores is shipped, and a very much larger one in the next. The monthly reports issued by the company are not unreliable in this respect, but are so in another, for although the quantities and price at which the ores are occasionally disposed of are given to the shareholders they are left in total ignorance of the monthly quantities and average price obtained for the metal—copper produced at the smelting-works. This omission prevents the company's transactions being followed by the shareholders, and is seriously felt by many of them, and by— M. E.

May 3.

PROSPECTS OF EMMA AND FLAGSTAFF MINES, UTAH, U.S.A.

SIR,—In your issue of April 14 appeared a very interesting letter calling attention to the Emma, Vallejo, Flagstaff, and Eclipse Mines in Little Cottonwood District of Utah, U.S.A. As I am familiar with these mines perhaps you will permit me through your columns to give a few additional facts to your readers. Several of these mines have past histories not without interest, and I feel confident they will have future histories even more interesting. That they are all on one great mineral vein is demonstrated by a continuity of underground openings, thus exploring the vein along its length about 1 mile. The vein throughout this distance averages about 150 ft. in width. Past history shows that from the Emma has been taken over $4,000,000 worth of ore, that from the Vallejo has been taken over $1,000,000, and that from the Flagstaff has been taken at least $2,000,000. The Eclipse being a new mine has not yet put out much ore, but has large bodies standing ready to be extracted when the tunnel now being run is completed. Under former management the orebodies of the Flagstaff were worked out, and development was neglected, so that the present management was obliged to explore with fresh capital. This they have been doing for some time with most flattering prospects, and no doubt this mine will soon be again productive. The Vallejo, which occupies the space between the Emma and Flagstaff, is owned by two men, one a practical miner, the other a practical business man They have worked the mine, so that it has been constantly productive, with development well ahead, and they have large reserves of ore. They have made handsome fortunes from it already. It is a great mine. The enormous yield of ore from the Emma all came out above a depth of 350 ft. The ore was speedily extracted; no exploring work was done, the mine became non-productive, and, for debt, passed to an American company. That company about three years ago, decided to explore the mine. They leased the Bay City tunnel (which cuts the vein at a depth of about 450 ft.), and carried on their explorations from and through it. They found the ore continuing down from the ore chambers in well-defined seams of great strength, and extracted considerable quantities. Desiring to explore "to the deep," below the tunnel level, they sunk an incline shaft on a well-defined ore seam about midway between the foot and hanging walls of the vein. At the depth of 180 ft. in this shaft they broke through a capping of iron (gossan) into an ore chamber, but a flood of water coming, and not having pumping machinery to take the water out, they were not able at that time to explore this ore chamber.

On account of the great flood of water which came into the shaft from this chamber the miners think it to be a very large one. About this time the Emma Mine became the property of the New Emma Company. Last June this company commenced sinking a vertical shaft further on in the tunnel, and purchased heavy pumping machinery. That shaft a month ago was down 140 ft. From that point to the shaft a cross-cut or drift is now being driven towards the vein (hanging-wall), and is now in probably 60 ft.: 30 ft. more will, no doubt, bring the heading to the vein, and then 75 ft. will bring the drift to the ore chamber at the bottom of the incline shaft.

Competent judges familiar with the Emma are confident that ore bodies will be encountered as soon as the vein is cut, especially in view of the recent great find in the Valley Mine, which is at a point only about 600 ft. from the point where the Emma cross-cut will strike the vein. In a few days—in fact, any day—we may expect to hear that a New Emma bonanza has been found, and I confidently expect to see both the Emma and Flagstaff in the list of dividend-paying mines within a short time, as the Vallejo is, and has been for a long time, and as the Eclipse will be, as soon as its owners have facilities for taking out the ore now exposed. MINER.

SLATE MINING IN FRANCE.

SIR,—The slate workings in the vicinity of the city of Angers is said to date back to the 12th century. Angers is situated on the banks of the Mayenne about 5 miles above its embouchere into the Loire, 150 miles from Paris. Generally speaking the houses are of wood covered with slate, which although when first brought from the quarries is of a blue-grey colour, yet on exposure to the weather assumes a rusty brown colour. This circumstance which gives the houses so sombre a hue has caused the town to be often called Black Angers. In this neighbourhood are extensive slate mines and quarries, from which slates are raised to the value of about 150,000*l.* annually. Slates of an excellent quality are also raised from quarries at Fumay and other places in Ardennes, where the mines are very similar to those in Wales, but their method of working is very different to that adopted in this country. Slate mines are understood to be far more dangerous to work than the true metal mines, and Dr. Foster reports that whereas the death rate in the Welsh slate mines is 3·28 per 1000 employed underground during the last seven years, that in Ardennes is only 2·85 for 11 years.

For a distance of 5 miles west-north-west of the Loire the slate zone is about 2500 ft. thick, which is separated into four parts, of which only the two upper are worked, and which are termed the "vein du Nord," and the "vein du Sud." The former dipping about 70° has a thill of alum slates and a 2½ ft. sandstone in the roof, and is about 600 ft. thick, of which only about 250 ft. is worth winning. The latter lies about 800 ft. below, dipping to the south about 70° with a working thickness varying from 150 to 600 ft. At the mines in the Ardennes in working the slate none of the large cavities are left open, but are filled with debris as they are excavated, upon which the miner stands instead of being supported by chains or ladders as in the Welsh mines.

In the Angers quarries when the slate is worked to the day large rectangular chambers are excavated from the surface about 70 ft. long in the direction of the cleavage, and about 50 ft. broad, going down vertically to a depth of sometimes 100 yards in good slate. A greater depth is not considered safe on account of rubbish falling from the sides of the cavities which becomes loosened by the atmosphere. The first 20 yards of rock from the surface is usually of so inferior a quality that it is worthless. A chamber when in full work can produce about 40,000,000 pieces of slate, which are cut in two sizes—those used abroad, 8·26 by 3·93 to 12·59 by 8·66 in., 0·09 to 0·16 in. thick, and those exported to this country, and known as English slates 11·81 by 6·29 to 29·19 by 14·17 in.; 0·15 to 0·24 in. thick. A long trench is made in the slate along the middle line of the chamber in the direction of the cleavage, about 4 yards deep and 1½ yard wide. From both sides of this trench the slate is worked off in steps towards the sides of the chamber, and when the first two stopes have been advanced 6 yards two more are started and the trench cut deeper. These steps are named "foncées," and each one is worked by about 20 workmen. Pillars are left along the line of strike of 10 yards on each side of the chamber which are continuous in the direction of the cleavage. Many accidents occur from falls from the roof of these chambers which is of a very treacherous nature; four or five men are constantly employed in each chamber to examine the roof with long iron bars from stages suspended by iron rods: overhead stoping has been adopted in some of the chambers which lessens the danger from the roof. The wages of the slate miner is about 5 frs. per day, and the labourers above-ground about 3½ frs. per day. The slate splitter is paid by the thousand, and a good man averages about 3 frs. per day.

The lighting of the underground chambers which has previously been by torches but has of recent years been much improved by the introduction of gas and electric light. No mechanical means of ventilation is necessary. Each quarry employs about 100 men. C. H.

ROCK-BORING MACHINERY—ANCIENT AND MODERN.

SIR,—It appears a little sarcastic on the part of Mr. J. McCulloch to mention the machines of Messrs. MacKean and Co. as a contrast to modern boring machines; it appears suggestive on the part of Mr. W. Michell Vivian to say whilst mentioning the same machines, that the losers in a former trial continue to pose before the public as the makers of the very best machines; and it appears rather white feathery on the part of Messrs. MacKean and Co. neither to accept Mr. Schram's challenge by staking the 100*l.* they have thus far only talked about, nor to attempt to prove (especially as I believe the inference does not refer to them) that they are not the beaten posers to whom Mr. Vivian alludes. The antiquity of the MacKean drill would not alone suffice as an evidence that it is not the best, for one of the most respectable of the secret societies—not the Fenians, but the Freemasons—are constantly singing: "Antiquity's pride, We have on our side;" yet, in these days of progress, antiquity is not usually claimed by an inventor as a recommendation for his machine, the inventor not generally posing like Dr. Schliemann as a discoverer of antiquities at pleasure, but as a real live specimen of humanity capable of beating all previous creation. He may pose, but it is always as a plastic pose representing the three M's, just as the old countryman used to represent the three R's, and as the Irishmen represented clamorers for the three F's. The inventor is like those whitened actors who are wound round on a disc, and are supposed by the exhibitors to look like Hercules, the Greek Slave, or the Last of the Mohicans according to the different attitudes they assume each time they come before the curtain. The inventor poses as Mystery, the Marvellous, and the Martyr, and in the first and last characters is usually sublime, at least in the opinion of those who admire a pose of the highly seasoned kind.

There is one thing about rock-drills which I really am surprised at, and that is the few descriptions of them that have been tried in Cornish mines. Of the almost innumerable rock-drills that have been from time to time advertised in the *Mining Journal* I have not seen half a dozen on mines on this side of the Tamar, and only one of those, I think, actually at work in a mine. I ask myself, then, why is this? and I can only assume the reply to be that Cornishmen, and, above all, Cornish miners, are too practical to adopt the toy drills which are brought into the county, even though their ingenuity, considered from the standpoint of the theorist, may gain them the Watt medal or any other local award. Inventors too often forget that when they come to Cornwall they have to deal with men who know their business as miners, and, therefore, cannot be gulled be persuasive eloquence like London boards of directors, and by that means wheedled into buying machinery that is worthless when put to the practical test. Yet sound engineers are sometimes mistaken, in proof of which I might allude to the well-known Dubois-François drill—one of the funniest machines for a rock-drill I ever saw in my life. It has, I should think, half a dozen pistons working at all sorts of angles and in, apparently, the most incovenient positions. I condemned the thing at once on looking at the drawings, and was inclined to follow the example of some of my professional colleagues and laugh at it outright; when I saw the machine itself I was still more amused, and it was only because the gentleman who wanted me to buy it was so excessively polite that I consented to go and see it in practical use. I at once admitted my mistake. The machine worked well, and I was told by those using it that it was economic, gave them no trouble, and that although it had been in every-day use for nearly four months it had not cost them a centime for repairs. Now, it will be noted that the Dubois-François was comparatively perfect just about the time when the testimonial (quoted by Messrs. MacKean and Co. in last week's Journal) of the St. Gothard official declared that MacKean's interesting machine—it always has been in an interesting condition—had *not* so far answered expectations, but that he hoped from the further modifications introduced and trials made that it would give better results in the future. If faint praise be condemnation Messrs. MacKean and Co.'s rivals have more reason than anyone else to thank the St. Gothard people for their certificate.

But this St. Gothard incident raises in my mind another question. What kind of reputation did the MacKean drill enjoy at St. Gothard *after* they had been fairly tested? for I just recollect that at a meeting I recently attended of the Institution of Mechanical Engineers the MacKean drill was mentioned in a way that seems to indicate that it was superseded, if it was ever used there, in the forebreast long before the completion of the tunnel. Several different types of rock-drill, says Mr. Wendelstein, were employed more or less at the St. Gothard Tunnel. Amongst these may be mentioned the Ferroux, the MacKean and Seguin, the Dubois and François, the Turrettini, the Burleigh, and others. The Ferroux drill was the first to be employed, having been invented in 1873 specially to work in this tunnel. In 1875 the original was superseded by a simpler form devised by the inventor, and this improved drill did the greater part of the work from thenceforward. Mr. Wendelstein remarks that as space will not allow of a description of all the varieties used, attention will be confined to this [improved Ferroux] drill as the most successful example. The improved Ferroux drill is about half the weight of the older form and less expensive. In the main works a piston fixed to a hollow piston-rod. The outer end of this rod is connected to the larger or working cylinder. In the latter works the striking piston, which is prolonged into a piston-rod, carrying at its further end the chisel or bit. The striking piston is conical at each end. At either end of the working cylinder are sockets at right angles to it, and in these work small plug-valves, which operate the entrance and exhaust of the air. These plugs are raised and lowered by the striking-piston, which, as it reciprocates, brings its conical ends under each plug alternately, and so lifts it. The plug, which is raised, acts through a lever to depress the other, and thus opens the other end of the cylinder to the outer air, whilst itself opening a passage from the compressed air in a small chest to its own end of the cylinder. The piston is thus driven back to the other end, where the same operation recurs, and thus the reciprocation is carried on. The compressed air enters the feeding cylinder from the supply-pipe through a stop-cock, and passes to the air-chest through the interior of the hollow piston-rod. At the same time, by pressing against the end of the main piston the air forces the hollow rod with the working cylinder attached to it, forwards towards the rock to be drilled. Along the top of the bearers which carry the machine is a rack. When the hole has been deepened by a distance equal to the interval of the teeth of this rack, the conical shoulder of the prolonged rod has advanced so far as to raise a fork which has two pawls engaging in the teeth of the rack. When these are raised clear of the rack, the striking cylinder advances by the length of one tooth, and this goes on until the cylinder has advanced the whole length of the rack. A plug, having the compressed air below it, operates to keep the fork down upon the rack, and to bring it down again the moment it is released by the piston-rod.

To prevent the striking cylinder from moving backwards in the opposite direction a small cylinder is provided at its rear end, and is open to the compressed air. In this cylinder is a plug, which presses upwards against a stirrup carrying at its lower part a cross-piece. This cross-piece engages with two racks on the underside of bearers, and having their teeth in the opposite direction to that of the racks on the upper side. Whilst this cross-piece is engaged with the rack no backward motion is possible; but it can be released at any time to bring back the drill by pushing back the stirrup. The rotation of the prolonged rod which carries the drill is given by an inclined groove in the enlarged part of the rod. Into this groove fits a projection from the ratchet-wheel. As the striking rock advances towards the rock the groove of it compels the wheel to turn in the direction of the teeth. When the rod comes back for another stroke the wheel is prevented from returning by a pawl, and, therefore, the piston-rod itself is compelled to turn. To bring the machine back when the hole is finished, the air, by simply turning two cocks, escapes from behind the piston through the small air-chest into the atmosphere, while it enters through another pipe into an annular space on the front side of the main piston and pushes it, with the striking cylinder and piston, back to the rear end of the main cylinder.

Now, what I think Messrs. MacKean and Co. should state for the information of the readers of the *Mining Journal* is, whether their drills were ever used for six consecutive months in the forebreast—that is to say, in the advance heading at either end of the St. Gothard Tunnel. I am well aware that MacKean drills were used in enlarging the tunnel, cutting away the rampe, and so on; but, as for this work, neither space nor character of drill was of much importance—they used almost anything that come to hand, and, as the MacKean drills were always well made by a first-class Scotch firm—MacClellan, I think—and had good metal used in them, they, of course, compared favourably with some of the commoner machines used beside them. There is no doubt that Mr. Ferroux was a thoroughly practical engineer and miner, and on the northern side of the tunnel had great influence; but he had the completion of the tunnel too much at heart to have put forward even his own machine, if any other would have done the work better or more quickly. If Mr. Wendelstein is correct in saying that after 1875 the greater part of the work of the St. Gothard tunnel was done by the Ferroux drills, Messrs MacKean have been claiming too much. If Mr. Wendelstein be in error it would be well for some one connected with the tunnel to state how many drills were in use during each year, and the names of the makers of the several drills, together with the number supplied by each maker and the work done with them. As these facts could be given by Mr. Ferroux, by Mr. Wendelstein, and by many others, there need be no doubt as to the truth being elicited.

Truro, May 2. HENRY PENROSE.

ROCK-DRILL CONTEST.

SIR,—I heartily endorse Mr. W. Mitchell Vivian's suggestion with regard to the coming competitive trial—"That two or three capable and well-known mining engineers be asked to act as a committee and judge these trials, and publish their award in the Journal"—as not one of the patentees in the past competitive trials will acknowledge they have been worsted, and, like the Kilkenny cats, will not give in, and are continually spitting at and scratching each other, until I verily believe a similar fate awaits them, and that nothing but their tails will soon be left unless some fortuitous circumstance rescues them from themselves.

It is an acknowledged fact that the advent of rock drills has been an exceedingly great boon to mining, but it is hardly feasible to suppose that they all possess the same qualities. I maintain that all patentees of rock drills are deserving of the appreciation and gratitude of the mining community, but if one drill exceeds the other in common justice to mankind give credit to whom credit is due, whether it be to McCulloch's, MacKean and Co.'s, or any other of the numerous drills who are incessantly "boring" into us that each one is better than all the rest. In the event of the contest being carried out equitably, and failing to pacify these turbulent patentees, it is to be feared they have stepped beyond the boundary of reformation, and their fate is to be sadly deplored. To effect a reconciliation between these "human boring machines" (the patentees) I deem an object worthy the attention of philanthropists. WM. NINESS.

Perranporth, May 2.

ROCK-BORING MACHINERY—SPEED ATTAINED.

SIR,—Replying to the letter of Messrs. Holman Brothers in last week's *Mining Journal*, we have to state that it was precisely the Kit Hill Mine Tunnel which we visited some two years ago, accompanied by a contractor of 30 years' experience. Upon returning to London we attended a board meeting of the company, and he made an offer to drive the tunnel with our system of boring machinery. If his offer had been accepted, the tunnel would have been finished some time ago, without any doubt, instead of being driven, as now, at a rate of only 6 to 9 ft. per week. As the rock is granite, which is, of all rocks, the most desirable for rapid tunnelling, it could, at the worst, only be the hardest of Cornish granite in which we could have guaranteed three to four times the speed that has been made until now, as weekly reported in the *Mining Journal*, and we should have been perfectly willing to leave (say) a quarter, at least, of the price of the boring machinery in suspension until the above should have been clearly proven. The height and width (8 by 8 ft.) are such as we should desire, in order to drive most rapidly. Without knowing the facts, we presume Messrs. Holman Brothers are the furnishers for the tunnel in question; but, whether they are or not, they should be well aware of the fact that, in case of a trial in the tunnel, the change from one system to another could not be effected instantly, nor without considerable preparation and some preliminary expense. Each class of machines would require its special mounting, the rails would have to be suitable for all the carriage mountings, and also the attachments. Messrs. Holman say:—"The drills could work for a day or week, in rotation, until each machine had bored for a given time, and not only the depth of holes, but the repairs, and also the consumption of air, could be accurately determined:" and they think such plan far more feasible than ours. But who of the parties even most directly interested could probably find time, at the moment of the trials to wait about the tunnel to witness this sort of demonstration? And again, the statement having been officially made that the ground changes in quality of hardness, would not this fact alone give rise to disputations in the sense that Mr. Vivian explained in the Journal of April 21? We must insist that our plan of a trial is more feasible, and can be made to attract fifty times the number of people anxious to learn the truth.

Messrs. Holman Brothers, as well as others, express their veritable fright at the enormous quantity of granite that would be wasted in making the experiments as we propose. We think the proper way would be to procure a number of (scabbled) blocks of, say, 4 ft. cube from one and the same quarry, and all the same quality in hardness, and we should propose on our part to bore the holes of such depth as has been found desirable for the most rapid driving, say, 3 ft. to 3 ft. 6 in. In one such block of granite we could bore as much as 261 holes, beginning with a 1¾ in. bit and leaving spaces of 1½ in. between the holes and 2 in. of margin around the block. The block would allow of boring the holes to a depth of 3 ft. 6 in., and finishing at, say, 1 in. diameter, which was about the depth and size found most suitable in the St. Gothard Tunnel. The total length bored in such a block would thus be 10,962 in. We do not understand Messrs. Holman Brothers' calculation of 3680 in., as on the conditions they mention (20 hours' actual boring at 13 in. per minute) the total length bored would be 15,600 in. This amount would only actually require 1½ such blocks of stone, as mentioned above. But we never claimed that, in practical driving, we would bore 13 in. per minute on an average; we stated this figure as the maximum bored by our machine with 1¾ in. bit, and with a pressure of 6½ atmospheres.

What we particularly want is to show the mine investing public as well as the executives what can be easily and simply accomplished in the way of prosecuting mining operations most rapidly. It has seemed to us in many cases that the executives have had more at heart to prosecute the work slowly for reasons we do not pretend to state. As a fact, we have never been disposed to spend the price of a machine in running down a customer; but in a few cases where enormous sums were being solicited for unexplored properties, we have sought by constant endeavours to capture an order.

We wish to notice a further matter which has been misleading to the public—we will not say intended to mislead. It was stated

some time since that—"That the boring of the Arlberg Tunnel is proceeding with unexampled rapidity: 3000 men are at work. The rate of advance averages 10 metres daily, which exceeds the average made with the St. Gothard by 6 metres. The boring is expected to be completed before the end of 1883." This is comparing the average of a week's, or at best a month's driving, under, perhaps, exceptionally favourable circumstances, with the total average of the driving at the St. Gothard. On this principle we might in perfect justice claim that the average advance with the aid of our machines would have been 11½ metres, as we have in one of our former articles mentioned that in the sole month of August, 1878, the advance made by our machines at the south side of the St. Gothard was 172 metres.

Paris, May 2. —— MACKEAN AND CO.

MINING MACHINERY FOR INACCESSIBLE COUNTRIES.

SIR,—Upon considering his letter in last week's Journal it occurred to me that if "H. G. T." only got practical information derived from experience he might not get all he wants, and that he would do better to consult a few manufacturers' illustrated catalogues, wherein he would find special machinery suitable to his work. I may say that a company had previously got their machinery from San Francisco; but their manager while lately in England had an opportunity of seeing English machinery at work in Cornwall and was so satisfied with its superiority, as compared with what they had hitherto been getting, that an order was placed with me on his recommendation. Both my stone crushers and pulverisers are made in sections, so that they can be carried on muleback, and are largely in use for reducing tinstuff, gold quartz, zinc, and other ores, both at home and abroad. Nothing comes amiss to my pulverisers. In the words of one firm using them in England, you can put in a paving stone and bring it out to any degree of fineness required. The great advantage of this machine is that where slime is an objection it can be avoided.

May 1. —— H. R. MARSDEN.

TIN JIGGING.—WHEAL JANE.

SIR,—It was with much pleasure that I read Capt. Southey's letter respecting the jigging process and its results at the above mine in last weeks Journal. It afforded me great satisfaction to learn that the machines were not a failure, as asserted at Mr. Argall's lecture by some gentlemen present. It would indeed be a pity if it were so, seeing that the mine, according to official and independent reports, has opened up so satisfactorily, and is on the verge of showing profitable results and giving dividends to the plucky adventurers.

Capt. Southey, however, made a very sweeping assertion when he said that "Cornish mines were paying 50 per cent. more in labour costs alone than they ought in preparing whits," and it would probably meet with a spirited opposition from those concerned. There is an old adage, "the proof of the pudding is in the eating," and with the view of quickly settling the difference of opinion I would most respectfully suggest that Capt. Teague accepts Capt. Southey's offer and himself allow Capt. Southey the privilege he so much desires.

In the interests of Cornish mining generally, and Wheal Jane in particular, it is extremely desirous to have the matter thoroughly tested, and it must be patent to all that the foregoing suggestion is the most efficacious method of so doing. J. R.

Torquay, May 3.

LEAD MINING AND THE ROYALTY QUESTION.

SIR,—In the long continued depression of the lead trade it becomes a momentous question for the proprietors of the Bettws-y-Coed and Lanrwst lead mines, and all concerned, as to what steps can be taken to place the properties in a more satisfactory condition, and to ultimately work them at a profit. The productive veins throughout the district are numerous; so much so, that even small setts of only 30 or 40 acres can generally show four, five, or six productive lodes, and some even more. But large bunches of galena are the exception, not the rule, and to make those mines yield a profit to the adventurers, and to improve the estate and benefit the neighbourhood the present condition of affairs must be reversed. Royalties should be considerably reduced, to meet the reduced state of the lead trade, and the mines must be worked entirely on an improved system, with rock-drills and far better dressing appliances, and to do this effectively something like united action must be resorted to by the different proprietors. It is generally admitted that, with lead at 12*l.* per ton, most of the mines could be made to pay, even with the present primitive method of working; and it has long been the hope and belief of most people that we should again see that price and upwards, but as time rolls on the prospect diminishes, the continental and other mines abroad, equipped with better appliances, are able to meet the demand at reduced prices, and still maintain their dividends, and it behoves us, "one and all," to put our houses in order and see if we cannot do likewise; and to this end the mines should be worked in groups most advantageous to their position instead of by the present contracted and very inconvenient boundary lines. Thus, tunnel adits should be run by machinery from the slopes of the mountain at the most suitable points, shafts sunk by the same means, where absolutely necessary, and parks of more effective dressing machinery erected at those points capable of treating all the ores from each group of mines, instead of squatting all over the mountain in patches as at present. Depend upon it this method of working must be resorted to at last, and the sooner the better. This will require time, money, and permanently and considerably reduced royalties, or even a remission of royalties altogether during the necessary heavy expenditure; but if this were once carried out there is not the slightest reason to doubt but that the mines would pay the landlords and adventurers far better at present prices than they can ever do with the present system, even at double the price of ore.

Bettws-y-Coed, May 2. —— CHAS. KNEEBONE.

COPPER ORES IN NORTH WALES.

SIR,—Unlike the lead mines of Bettws-y-Coed and Llanrwst, the copper mines of the Snowdon range are generally held in large grants varying in extent from 700 to 1700 acres each, and at moderate royalties of 1-16th to 1-20th, and the facilities for working by adit tunnels to varying depths of from 100 to 300 fms., together with the abundant water supply for all purposes are altogether unique. For generations past the mines have yielded immense quantities of copper ores of 12 per cent. and upwards, and from reports before me I see one well-known mining authority estimates that one of those mines has an accumulation of halvans of upwards of 70,000 tons, that with dressing appliances would alone yield 50,000*l.* profit. In others the halvans are variously estimated at from 25,000 tons to 40,000 tons of from 3½ to 5 per cent. copper. Whether these figures are high or not the bulk of halvans is enormous, and a large quantity of it will produce (even with our wretched mode of dressing ores) fully 5 per cent. fine copper, consequently the ores sold must have been very considerable indeed. But to explain how it is that such quantities of rich halvans are left, I may state that in former times the ores were from some of the workings carried to the highways on men's backs, or at best with donkeys and mountain ponies, and nothing was sent to market under 12 per cent. The ores were hand-picked and cobbed or bucked, and seldom or never put to water, the residue being thrown aside.

I know four of those mines that can now, from stopes opened and ready for working, return unitedly 400 tons of 10 per cent. ores monthly, and would in two years double that quantity if they had proper dressing appliances, incline tramways, and improved means of transit after; while it is estimated that the concentration of the halvans alone would in four or five years pay for all the plant and machinery. If either of those four mines were situate in Cornwall, and had yielded such quantities of rich ores in the past, and 100,000*l.* was required to erect large engines and sink 100 fathoms deeper the money would be forthcoming. Why, then, is it that we cannot get a few thousands here? Or, why should the investing public be so despondent because they cannot put their money into deep watery holes, when they can come here and see for themselves, and invest it in equally rich mines, high and dry, and bleaching alternately in the storms and sunshine. But besides the rich copper lodes referred to, there are immense quantities of copper pyrites, yielding 5 per cent. copper, 40 for sulphur, and 25 to 30 for iron; and the Sygun and Cribb Ddu United Mines alone could produce 1000 tons monthly for reduction by the wet process, with a very moderate outlay.

Bettws-y-Coed, May 2. —— C. KNEEBONE.

LEVANT MINE, AND ITS MANAGEMENT.

SIR,—The question of the influence of certain lords upon Cornish mining, alluded to in my last, is now attracting general attention, which may be considerably enhanced by an insight into the position of Levant, which has suffered more intensely than any mine in Cornwall, and is still doing so. Twice has the motion been carried and entered as such, that an insurance be effected to protect the mine against the Employers' Liability Act, the last time a twelvemonth since, yet the mine is still left unprotected, the reason being that insuring the men would take up the whole of the 6d. per month contributed by them, whereas the men hitherto have been allowed 5s. a week, which is about one-third of the amount weekly that an insurance company would guarantee the men; the other two-thirds has been credited to the men up to January 1882, amounting to 451*l.* 14s. 4d. Since that time the men's club money has been sunk in assets to the mine, and no account has been rendered of the amount saved since. The purser and committee have given out that they have compromised the matter with the men by their stipulating to pay them for the future the munificent sum of 7s. 6d. a week in case of serious accident. RICHARD B. SEARLE.

St. Just, May 2.

THE PERRANZABULOE MINES.

SIR,—It is truly astonishing to me that out of all the once famous mines of this locality only two are now working in the vicinity of Perranporth, not many years ago the centre of a busy mining district—East Chiverton and Perran Silver-Lead Consols, which are almost sure to make history by proving remunerative. I think the excellent results so far obtained at these mines ought not to pass unnoticed, and should in themselves be a sufficient guarantee to draw their attention to this locality as to its mineral wealth. Excepting in the case of rich Old West Chiverton and the two mines named, the district of recent years has been somewhat unfortunate in regard to mining, but the cause is apparent, and not far to seek. It is well known that its mines have not made noteworthy riches shallow, and mining companies in many cases have wasted their capitals in rooting after shallow shoots of ore instead of sinking. Take as an instance of this the fate of Gravel Hill, Treamble, and Deer Park Mines, under the proprietary of the New Quay Mining Company. In the first two of these mines a considerable sum of money has been spent in raising low quality iron ore, instead of which had the company spent their time and money in raising killas (clay-slate) they would now undoubtedly have capital in hand, as when the killas had been tipped over the burrows they would then know the end of it, but to spend money in raising iron ore, which long ago was found an impossibility to make it pay, and lose thereby is simply preposterous.

There is no doubt in the minds of miners acquainted with the district but that the whole three of these mines would prove productive in depth, and are well worthy of further development. The situation of Gravel Hill Mine is remarkably good, and worthy of special reference. Not many fathoms to the east is the rich Phœnix lode, and in closer proximity to the west is the Penhale lode, to the north is a large elvan course, and to the south another. The junction of the lodes in this district with the elvan courses invariably considerably improves their value; yet the company have not thought it worth their while to intersect any of these four points. The manager was not to blame in the matter, as he is a practical miner, and had the company permitted him to use his own judgment, I doubt whether they would be in the dilemma they are to-day. Perranzabuloe district formerly held its own in the county for dividend mines, and will do again with capital judiciously laid out. Some of its mines were closed in bad times; times are bad enough at the present in the price of some minerals, notwithstanding the great improvement in mining appliances since the mines ceased working. If they were resuscitated they would more than counterbalance the low price of minerals, and leave a substantial margin for profits to adventurers. Perranzabuloe district adjoins that of St. Agnes and Gwennap, and, as far as mineral wealth is concerned, equals either of these famous districts of untold riches. WILLIAM NINESS.

Perranporth, May 2.

EAST WHEAL ROSE.

SIR,—In last week's *Mining Journal* I read a very tame article upon the above mine, and was at first puzzled as to the exact object of the writer, but it is evident he has other mines which he wishes to make the public believe are vastly superior, and that East Wheal Rose is worthless. We are informed that this property was on the point of being abandoned when the stroke of the pick laid bare Middleton's lode. Now this is the very lode which is expected to prove so valuable for the present shareholders, and shares, then 128 in number, were sold at as high a price as 1500*l.* each, or equal to 192,000*l.* for the property. A very great catastrophe then overtook the adventurers, and one, I should imagine, hardly likely to ever occur again to the same mine—a waterspout broke over it, filling it with water, thus proving that the mine was not worked out but, as has been stated, drowned out; therefore, as soon as drained it will prove as good or better than then; for, with the magnificent machinery they now possess they can cope with any amount of water, and, judging from the energetic manner in which the mine is being worked, I should think they will raise as much ore in a week as was formerly raised in a month. Lead is low in price now, and as low as ever it will be, but there are signs of a rise in the price of this metal in the immediate future.

Shareholders should, before sacrificing their holding, take into consideration that when there was vastly inferior machinery for dressing, pumping, and raising, this property was selling for 192,000*l.*, and only 500 tons of lead per month being raised. Now they have machinery capable of dealing with every contingency, a certainty too that there is metal in abundance, an energetic management, and a good market for their shares if they themselves do not spoil that market by being too hasty in believing every adverse rumour.

In conclusion, let shareholders remember that the "bears" were offering as much as 5s. and 6s. per share for the loan of them at last settlement, and are doing all they can to recover themselves; their losses having been so great they must naturally wish to recoup themselves, and the only way they can do so is to frighten holders. There is a company registered—the New East Wheal Rose Silver-Lead Mining Company—with a share capital of 50,000*l.* Will this not benefit the shareholders? I think it will. Do not let detractors get the mastery of the position is the advice of—

—— ONE WHO WATCHES.

MINES IN THE CALLINGTON DISTRICT.

SIR,—Within the last week I visited the Bicton Silver-lead and Copper Mine. As I had not been there for two years I expected to see great alterations, but they far exceeded my expectation. The engine-shaft is sunk 60 fms. under adit, where the lode is 4 ft. wide, composed of horn and fluor-spar, chlorate of lime, ruby blende and silver-lead, a splendid looking lode; at the 40 fm. level the lode contained a great deal more gossan and much less of the spar and lime. I think from the character of the lode a few fathoms deeper it will be found much richer than at present. I recollect in Holmbush Mine before reaching the fluor-spar or cann we had exactly the same character lode this is at present. On driving north on this lode there is a very large copper lode to be intersected. Where opened on at surface it is 9 ft. wide, composed of quartz, felspar, mundic, and copper ore, certainly a splendid looking lode. From its bearing I think it is a continuation of one of the South Caradon lodes. That mine paid in dividends 384,000*l.* on an outlay of 640*l.* About 35 fms. west there is another lead lode 5 ft. wide, a very promising looking lode. These two lodes have been wrought on near the surface from time to time this last 50 years.

The agents, in making some excavations to get debris for raising the banks of the reservoir, intersected another lode 2½ ft. wide, with spots of silver-lead to be seen in it running parallel with the other two. About 300 fathoms east of engine-shaft about 25 years ago a Capt. Joe Penpraze drove an adit a short distance and intersected a parallel lode; that will be four lead lodes known to be in the Bicton sett, in addition to the copper lode opened on. This property being fully a mile square it is more than probable there are other lodes not discovered yet, particularly east and west lodes, as it is just in line with the Caradon mines. There has been a great deal of work done at surface in laying out necessary plant for dressing and other purposes, and there is great credit due to the agents for the progress they have made. The dresser with his staff was busy on the floors preparing a parcel of their silver-lead for market. I hope on my next visit I shall see the shaft going down, and if sunk on the course of the lode it is my firm opinion they will soon have sufficient lead to pay for sinking. The stratum is a mineralised blue clay-slate, very congenial for the production of rich deposits of ore.

Callington, May 2. —— JNO. BUCKINGHAM.

CORNISH MINING—THE GWENNAP DISTRICT, ITS PAST HISTORY, AND PROSPECTIVE VALUE.

SIR,—That history repeats itself we have abundant proofs in the mines of this district. The richest lodes cropped out full of mineral at surface, wrought to great advantage shallow, abandoned, resuscitated, and became richer and richer on more extended operations. We have evidences in the Great Consols and United Mines (more recently known as the Clifford Amalgamated Mines), Penstruthal, Wheal Buller, Ting Tang, Wheal Unity, and Tresavean; the latter was wrought successfully by three companies. The first was formed by Mr. Williams, of Barncoose, in this parish (Gwennap), the founder of the present Scorrier House family, and worked only to the shallow adit without any kind of machinery; at this depth, about 30 fms. from surface, Mr. Williams gained by his share 20,000*l.*, while Mr. Buller was so much pleased with his share of the profits that he built a gallery in the parish church as a thanksgiving offering, which bore the date of 1752. This superficial deposit failed, and the mine abandoned, but in after years was resuscitated by the son of its former discoverer, and wrought to great advantage as deep as the primitive character of the machinery would admit of.

After some time the late Capt. W. Martyn and others purchased the materials, and subscribed a working capital of 1000*l.*, which succeeded in discovering mineral, the profits from which averaged 40,000*l.* per year for 10 years. The whole profit from the mine has exceeded 1,000,000*l.* sterling, the whole of which was derived from copper deposits "upon" the elvan, the theory then being if mineral made over and upon the elvan there was not much chance of finding any when the lode crossed and got below it. Thanks to the late Capt. Charles Thomas, his great discovery of tin under the elvan at Dolcoath exploded this theory, hence deep tin mining in what were once the richest copper mines of Cornwall—indeed, the Dolcoath is richer at its present depth of 400 fathoms than at any period of its history. The bottom of Great Consols, in the Gwennap part of the Clifford Amalgamated Mines is, like Dolcoath, under the elvan, the lode being in a transition rock, passing from copper to tin, at the same time maintaining its immense size, and whenever deeper developed will prove equal, if not richer than Dolcoath. The lode in the bottom of Tresavean is undergoing a similar change below the elvan. I have the testimony of the late Mr. J. M. Williams, of Pengreep, in this parish, who saw the bottom of the mine previous to its stopping, which was in consequence of a dispute between the company and the landlord as to renewal of lease, that the bottom level has been driven over a lode 40 fathoms in length, worth 40*l.* per fathom, when tin was only 40*l.* per ton; at present price of tin this lode would be worth 70*l.* per fathom. This tin ground is all standing, and available as soon as the mine is drained.

It must be remembered that the improved mechanical appliances and new explosives enable a mine to be wrought at 300 fms. deep as cheaply as it used 30 years ago to work one at 150 fms. deep. Moreover, the elvan is of a correspondingly crystalline character to the one in connection with the great body of tin in Dolcoath, and from the desirable similarity of the main superstructural characteristic conditions of the lode in question to the lodes of the most productive mines of Cornwall, it is to be relied on that increased depth of development is only required to ensure the realisation of a tin mine of very great value in Tresavean. This opinion is justified by analogy, to which, practically, scientific mining authorities will even attach great importance, having proved to be the safest guide in forming their opinions of the inherent value of mineral properties.

St. Day, Scorrier, May 2. —— CHAS. BAWDEN.

CARN CAMBORNE, AND ITS PROSPECTS.

SIR,—Being a large shareholder in this mine, and hearing about the late improvement, I devoted a whole day inspecting the property in order to see for myself. I was much struck with the massive lode in the 95, west of engine-shaft; to see the large vughs, some of them big enough for a man to crawl into, and all of them full of magnificent specimens of rich copper ore. There cannot now be the slightest doubt but what this is the beginning of a splendid course of copper, and a very important point will shortly come off—one that will be carefully watched by a great number of mining men in the county—the intersection of the same lode at the 105 10 fms. deeper, the engine-shaft, which is a good one, being perpendicular to this point, and the cross-cut is being vigorously pushed forward towards the lode.

The locality is everything that could be desired, being surrounded by the richest mines in the county, such as Dolcoath, South Condurrow, and others. The property being in such close proximity to these mines makes it all the easier to work, in fact I may say, without fear of contradiction, it is the most inexpensive concern to develope of any in the county of Cornwall. Therefore, when the deeper levels are laid open, I am fully convinced that great and lasting profits will be realised.—*Carn Camborne Mine, May 2.* A. C. S.

NEW TERRAS TIN MINE.

SIR,—In reply to the letter of "New Terras" in Journal of April 21 as to the above mine, kindly allow me to give some of the information he requires. There is no doubt that New Terras is in the heart of a very rich tin-bearing district, and that tinstone of a high class quality runs through the entire length of the New Terras sett. I know this from my own investigations. There appears to be some doubt, however, as to whether this tin is in the great elvan course there found, or is in lodes adjoining, and sometimes intersecting this elvan course. This doubt may now be considered as set at rest, for the tin is in lodes of fine formation, lying close to the elvan, and having powerful branches passing through the same, although the elvan throughout is highly stanniferous, and will pay well for dressing. I have assayed samples of tinstone taken from New Terras, some of which have given over 3 cwts. of fine tin ore to the ton of stuff, and many such where the yield has been over 1 cwt. to the ton. However, I take the general average of the ore now broken at New Terras and waiting to be stamped to yield from 40 to 50 lbs. of tin to the ton of tinstuff, and there are but few mines in Cornwall that will attain to this standard.

From what I have here seen the company have now about 500 tons of good ore ready for stamping; some of this at the surface, some broken but not yet raised from underground. A new shaft has been sunk on the south side of the great elvan dyke, and is now nearly to the depth of the great winze sunk from the old adit by the former company on the north side; it is the intention of the manager to drive a cross-cut from the new shaft at bottom to this winze, and by so doing cut through the heart of this great tin lode. I feel certain the result will be highly satisfactory as regards quality of ore, whilst it will open up immense reserves for future operations. In sinking this shaft a caunter lode has been cut at about 17 fms. depth from the surface. From what I saw last week—if the stamping and dressing operations have not already commenced—they may be expected to do any day now, and I have no doubt some tons of tin will be in the market in two months from this date; and this, too, in the face of many difficulties, which the directors had to contend with.

There is one important feature to be borne in mind as to this property. If any person will take the trouble they may now witness a novel sight. There is at the present moment a ploughed field adjoining New Terras Mine, literally covered over with tinstone of a

high quality (the white and brown resin tin); and two hedges of this field, having been built from the larger stones taken from this field, are one-half fine tinstuff ready for stamping. The owner of the field has ploughed over the backs of two lodes coming in from Terras Mine, and hence the novel display. I need not add more to satisfy your correspondent as to the value of this property—a few hard facts are worth tons of theory. New Terras will undoubtedly be a dividend-paying mine, and one that with good management will continue so for many years to come.—*Truro, April* 25. F. A.

Registration of New Companies.

The following joint-stock companies have been duly registered:—

THE LONDON AND DERBY ELECTRIC WIRE COMPANY (Limited).—Capital 5000*l.*, in shares of 1*l.* To acquire and carry on a business of electric and telegraph wire manufacturers, situated at Royal Victor Place, Old Ford-road. The subscribers are—J. Hunt, 122, Fore-street, 150; L. Musk, 73, Mortimer-road, 10; C. W. Boot, Camborne, 150; W. Higginbottom, Derby, 150; E. Bindoff, 20, Southborough-road, 10; W. J. Levi, Dalston, 10; G. J. Thornhill, 76, Wood-street, 10.

THE UNITED KINGDOM BOAT AND FISHERMEN'S ACCIDENT INSURANCE COMPANY (Limited).—Capital 25,000*l.*, in shares of 1*l.* The insurance of fishing smacks and vessels, and that of marine insurance and underwriting in all its branches. The subscribers (who take one share each) are—E. J. le François, Forest Hill; T. W. H. Delf, 123, Bishopsgate-street Within; A. Maude, 7, Union-court; C. W. Hastings, 42, Buckingham-street; E. A. Smith, 117, Edgware-road; J. W. Wright, 56, New Broad-street; H. Shorter, West Dulwich.

THE BRISTOL CHANNEL EXPRESS STEAMSHIP COMPANY (Limited).—Capital 20,000*l.*, in shares of 10*l.* A shipowner's business in all branches. The subscribers (who take 10 shares each) are—J. P. Hacquoil, Cardiff; J. G. Marychurch, Cardiff; T. J. Williams, Cardiff; C. McConochie, Cardiff; J. Elliott, Cardiff; A. Thomas, Cardiff; E. Williams, Cardiff; J. McConochie, Cardiff; R. Wain, Cardiff.

THE HASTINGS ALBION HOTEL COMPANY (Limited).—Capital 16,000*l.*, in shares of 10*l.* The usual business of a hotel proprietor in all branches. &c. The subscribers are—J. Bell, Hastings, 50; A. Breeds, Hastings, 10; J. Hackett, Hastings, 5; F. Rossiter, Hastings, 30; E. H. Langley, Hastings, 50; S. Chandler, Hastings, 40; C. Ashenden, Hastings, 10.

THE PATENT AUTOMATIC SASH MOTOR COMPANY (Limited).—Capital 10,000*l.*, in shares of 5*l.* To carry on a business in conjunction with certain acquired patents. The subscribers (who take one share each) are—G. Hurdle, Southampton; A. L. Hatherley, Southampton; J. H. Miles, 23, Margaret-street; A. W. Barneveld, Peckham; C. R. A. Derby, 418, Commercial-road; G. F. Page, Kingston-on-Thames; F. Grant, Highbury New Park.

THE LONDON FOUNDERS ASSOCIATION (Limited).—Capital 10,000*l.*, in shares of 1*l.* The business of financial and general agents, to promote the formation of joint-stock companies, &c. The subscribers (who take one share each) are—A. W. Barneveld, Peckham; C. R. A. Derby, 418, Commercial-road; G. F. Page, Kingston-on-Thames; F. Grant, Highbury New Park; A. L. Hatherley, Southampton; J. H. Slater, 58, Haverstock Hill; A. C. Kenderick, Shepherd's ush.

THE SHAREHOLDERS' RECORD AND ENQUIRY OFFICE (Limited).—Capital 5000*l.*, in shares of 10*l.* To supply information and advice to share, bond, or debenture holders, or investors in any company, corporation, association, &c. The subscribers (who take one share each) are—N. Price, Hornsey; C. T. Campin, 52, Royal-road; R. W. Pyne, Camberwell; J. F. Pearce, Chadwell Heath; J. Hudson, 2, Vaughan-road; T. H. Smellie, 85, Gracechurch-street; G. Chapman, 20, Great Winchester-street.

THE PATENT INVERT SUGAR COMPANY (Limited).—Capital 80,000*l.*, in shares of 10*l.* To acquire and work a patent, and to produce syrup or invert sugar, spirit, and bye-products. The subscribers (who take one share each) are—H. Duncan, 38, Cornhill; C. A. Robertson, 9, New Broad-street; E. P. Thomas, 4, Finsbury-circus; G. B. Mee, 9A, Great Winchester-street; W. H. Thompson, 12, Kirkshall-road; J. S. Morrison, Blackheath; F. Orme, 1, Vincent-square.

THE CITY AND SUBURBAN FREEHOLD LAND AND GROUND RENT COMPANY (Limited).—Capital 100,000*l.*, in shares of 5*l.* To purchase the Norbury Park Estate, in Surrey, and carry on the usual business of a land company. The subscribers are—G. Sims, 169, Aldersgate-street, 50; A. J. Altman, Little Britain, 50; W. R. A. Cole, 15, King-street, 400; C. H. Robarts, Enfield, 25; W. Bennett, 15, King-street, 50; G. Willsmer, Baltic House, 25; G. Collier, Enfield, 25.

THE NORTH OF ENGLAND SYNDICATE OF FINANCIERS (Limited).—Capital 25,000*l.*, in shares of 5*l.* The formation, promotion, and registration of public companies. The subscribers (who take one share each) are—E. J. Hooper, Manchester; F. G. Dawson, Barnsley; J. R. Horner, Manchester; F. Morris, Manchester; H. Peplow, Manchester; A. Mills, Manchester; F. Townsend, Wittington.

THE ONWARD INVESTMENT COMPANY (Limited).—Capital 50,000*l.*, in shares of 5*l.* The usual business belonging to a land company and building society. The subscribers are—J. Potts, Sunderland, 10; J. Eggleston, junior, Monkwearmouth, 5; H. Horner, Sunderland, 5; R. Hodgson, High Southwick, 5; M. Nelson, Sunderland, 5; J. Armitage, High Southwick, 5; F. Badcock, Bishop Auckland, 5.

THE GILPIN CONSOLIDATED MINING AND MILLING COMPANY (Limited).—Capital 50,000*l.*, in shares of 1*l.* To adopt and carry into effect an agreement made between G. F. Smith, the vendor, of the one part, and W. C. Durham, of 7, Union-court, E.C., of the other, for the acquisition of the Foot and Simmons' Lode, the Next President Lode, and the Bledsore Lode, situated in the Gregory mining district, State of Colorado, United States, together with all the rights, benefits, privileges, and advantages, and a 25-stamp mill, with 25-horse power engine, and the machinery, &c., belonging thereto, for the purpose of developing, opening up, and working the said or any other mining properties. The subscribers (who take one share each) are—W. B. Harte, 14, Union-court, solicitor; F. R. Stevenson, 42, Old Broad-street, jeweller; A. S. Ramskill, 7, Union-court, solicitor; W. Silver, 70, St. Peter's-street, clerk; G. F. Davenport, 7, Drapers' Gardens, stockbroker; R. Whitham, 13, Maxilla Gardens, gentleman; C. W. Gorringe, 53, Alexandra-road, clerk. The subscribers shall determine the names of the first directors, whose number must not be under five or exceed six.

BULL'S IRON AND STEEL (SHEFFIELD) COMPANY (Limited).—Capital 250,000*l.*, in shares of 1*l.* To acquire, in conjunction with certain patents, the business of engineers, copper and iron founders, smiths, iron and steel manufacturers, &c. The subscribers are—H. C. Bull, Liverpool, 1; J. J. Warry, Higher Tranmere, 1; V. W. Jones, Liverpool, 1; W. Walker, Sheffield, 1; F. B. Wrightson, 9, Great St. Helen's, 1; J. H. Walker, Hatfield Peverel, 10; C. O. Green, 7, Great St. Helen's, 1.

THE SAND CREEK LAND AND CATTLE COMPANY (Limited).—Capital 100,000*l.*, in shares of 10*l.* To buy, breed, graze, and sell cattle, sheep, and other live stock in the United States. The subscribers (who take one share each) are—H. W. Fell, 34, James-street; C. Fletcher, 91, Victoria-street; H. Seton-Karr, 11, Queen's Gardens; G. R. Thompson, 15, Glendaver-place; W. J. Martin, Barrow-in-Furness; H. Ingleby, 20, Spring Gardens; C. F. Pearse, 20, Spring Gardens.

THE AMERICAN OIL AND OZOKERITE COMPANY (Limited).—Capital 200,000*l.*, in shares of 5*l.* To acquire any mines, lands, and mining claims containing ozokerite, paraffin wax, mineral wax, oil, petroleum, coal, sulphur, &c., in the territory of Utah, United States, or elsewhere, and to work and fully develope any or all such properties, and carry on all operations connected with exploring, mining, farming, &c. The subscribers (who take one share each) are—T. L. Robinson, Charing Cross Hotel; P. C. de Soutres, 110, Cannon-street; G. R. Logie, 2, New-street; J. Gregory, Blackwater; W. Tregellas, 40, Bishopsgate-street Within; R. Hancock, Islington; H. O. Alexander, Highbury.

THE COMPOUND RUBBER COMPANY (Limited).—Capital 7000*l.*, in shares of 1*l.* The business of manufacturers of and dealers in any compound, articles, or materials under any patent in which the company may be interested. The subscribers (who take 250 shares each) are—T. Klein, Stoke-on-Trent; G. J. Cuddon, 4, Broad-street Buildings; W. Hall, Hibernian Chambers; G. W. Kekewich, Hibernian Chambers; J. Blow, jun., Clapham; J. H. Bedfield, 48, Lime-street; R. R. Edwards, Dalston.

THE BROUGH WITH HILBECK MINING COMPANY (Limited).—Capital 25,000*l.*, in shares of 25*l.* To acquire by purchase or otherwise the veins or seams of lead, iron, barytes, coal, fire-clay, and other minerals, rights, and privileges, &c., within the parish of Brough, county of Westmoreland, and to carry on in their various branches the trades of miners and smelters, and for said purposes to search for, get, and make merchantable, sell, and dispose of lead iron, barytes, coal, &c. The subscribers are—G. W. Dalston, Brough, M.D., 20; C. R. Davis, Brough, engineer, 30; J. Simpson, Brough, tanner, 10; W. Hilton, Brough, builder, 30; J. A. Longstaff, Brough, timber merchant, 10; J. W. Allison, Brough, miller, 20; J. Hilton, Brough, draper, 10; T. Bainbridge, jun., Brough, farmer, 10; T. Hilton, Brough, builder, 20.

THE STUDIOS OF MEDIÆVAL AND INDUSTRIAL ART (Limited).—Capital 10,000*l.*, in shares of 5*l.* The establishing of an institute in London or elsewhere for art exhibitions, &c. The subscribers (who take one share each) are—R. J. A. Freeborn, Richmond; H. McDowell, 40, London Gardens; G. F. Bainbridge, 22, Spencer-road; W. A. Cole, 5, Stamford-road; F. Gordon, Great Stanmore; H. A. Whateley, Lincoln's Inn-fields; S. W. Oakwood, Crayford.

THE VICTOR GAS ENGINES COMPANY (Limited).—Capital 50,000*l.*, in shares of 5*l.* The business of engineers, ironfounders, and boilermakers, and the acquisition of certain patents. The subscribers (who take one share each) are—S. Carnaby, Liverpool; L. Currie, Liverpool; J. Hope, Liverpool; J. G. Banes, Liverpool; W. D. Williams, Southport; J. MacDougall, Walton; J. Southward, Liverpool; H. Walters, Liverpool.

THE NEILGHERRY PLANTING AND FIBRE COMPANY (Limited).—Capital 25,000*l.*, in shares of 25*l.* The cultivation of coffee, cinchona, tea, tapioca, india-rubber, &c., in the Hill District of Southern India. The subscribers (who take one share each) are—J. W. J. O'Donoghue, 1, Cambridge Villas; F. Derridge, 36, Basinghall-street; W. E. Death, 20, Bucklersbury; J. Murphy, Leytonstone; J. V. Musgrave, 15, Westbourne Park; C. R. Gibb, 159, Mayall-road; J. F. Hartley, 18, Royal Crescent.

STEAMSHIP "CAIRNGORM" (Limited).—Capital 34,000*l.*, in shares of 50*l.* Purchasing, owning, and working said steamship. The subscribers (who take one share each) are—J. Jones, 5, Newman's Court; J. H. Robertson, 5, Newman's-court; F. D. Frost, 11, London-street; A. J. Frost, 11, London street; D. Hughes, Liverpool; W. Crosfield, Liverpool; J. Thomas, Liverpool.

THE MEXICAN GAS AND ELECTRIC LIGHT COMPANY (Limited).—Capital 100,000*l.*, in shares of 20*l.* The manufacture, sale, and disposal of gas and electricity generally in connection with the Republic of Mexico, and the acquisition of all necessary gasworks, &c. The subscribers (who take one share each) are—H. H. Gibbs, 15, Bishopsgate-street Within; A. Sillem, 15, Bishopsgate-street Within; A. G. H. Gibbs, 15, Bishopsgate-street Within; H. C. Hayne, 15, Bishopsgate-street Within; H. C. Gibbs, 15, Bishopsgate-street Within; V. Gibbs, 15, Bishopsgate-street Within; W. Barron, Paris.

PROVINCIAL STOCK AND SHARE MARKETS.

CORNISH MINE SHARE MARKET.—Mr. S. J. DAVEY, mine share-dealer, Redruth (May 3), writes:—We have had a better demand for shares this week in our market and higher prices. Carn Brea advanced ¼, Dolcoath 4, East Pool 1, Killifreth ⅜, Pedn-an-drea ¼, West Kitty 1, and Wheal Uny ⅜. To-day market is quieter at easier prices. Closing quotations herewith:—Blue Hills, ⅝ to ¾; Carn Brea, 6¾ to 6¾; Cook's Kitchen, 27 to 28; Dolcoath, 63 to 63½; East Blue Hills, ¼ to ½; East Pool, 45 to 45½; East Uny, ¼ to ⅜; New Cook's Kitchen, 5 to 5½; New Kitty, 2 to 2¼; Pedn-an-drea, 1⅜ to 1⅝; South Condurrow, 8⅛ to 9; South Crofty, 7¾ to 8; South Wheal Frances, 8 to 8¼; Tincroft, 8¼ to 8¾; West Basset, 5 to 5½; West Frances, 3 to 4; West Kitty, 13⅞ to 14½; West Peevor, 5 to 5½; West Poldice, 1⅛ to 1⅜; West Seton, 14 to 15; Wheal Agar, 14½ to 15; Wheal Basset, 5⅛ to 6; Wheal Grenville, 6¼ to 6½; Wheal Kitty, 1⅝ to 1¾; Wheal Peevor, 3⅞ to 4⅛; Wheal Uny, 3⅞ to 4⅛; Wheal Coates, 4s. to 6s.

— Messrs. ABBOTT and WICKETT, stock and share brokers, Redruth (May 3), write:—A little more business has been done this week and the market is some what healthier. Dolcoaths East Pools, Killifreths, Carn Breas, Tincrofts, West Kittys, Pedn-an-dreas, and Wheal Unys have changed hands at improved rates. Closing prices annexed:—Blue Hills, ¾ to 1; Camborne Vean, ⅛ to ¼; Carn Brea, 6¾ to 6¾; Cook's Kitchen, 27 to 28; Dolcoath, 62½ to 63½; East Pool, 45 to 45½; Killifreth, 2⅝ to 2¾; Penhalls, ⅜ to ⅝; New Cook's Kitchen, 5 to 6; New Kitty, 2 to 2¼; New Trumpet, 1 to 1¼; North Busy, ⅛ to ¼; Old Gunnislake, ⅜ to ⅝; Pedn-an-drea, 1⅛ to 1⅜; South Condurrow, 8⅛ to 9; South Crofty, 7⅞ to 8¼; South Frances, 7¾ to 8; Tincroft, 8½ to 8¾; West Basset, 5¼ to 5½; West Kitty, 13¾ to 14; West Peevor, 5½ to 6; West Frances, 4 to 5; West Tolgus, 10 to 12; West Seton, 15 to 17; Wheal Agar, 14½ to 15; Wheal Basset, 5½ to 6; Wheal Grenville, 6 to 6⅝; Wheal Kitty, 1⅝ to 1¾; Wheal Peevor, 4 to 4¼; Wheal Uny, 3⅞ to 4⅛; Wheal Comford, 1¼ to 1⅜.

— Mr. M. W. BAWDEN, Liskeard (May 3), writes:—The mining market throughout the week has shown a decided improvement, and most tin shares are firmer. The satisfactory reduction of 943 tons on tin stock for April, showing a considerable decrease on previous exports, will doubtless have a tendency to further enhancement. Dolcoath, East Pool, Marke Valley, Pedn-an-drea, South Crofty, West Basset, West Kitty, and Wheal Uny chiefly in request. Subjoined are the closing quotations:—Bedford United, 1¾ to 1⅞; Carn Brea, 6⅝ to 6¾; Cook's Kitchen, 28 to 28½; Dolcoath, 64½ to 65; Devon Consols, 5¾ to 6; Devon Great United, ⅛ to ¼; East Caradon, ¾ to ⅞; East Pool, 45⅛ to 46; Gawton United, ⅜ to ⅝; Glasgow Caradon, ⅝ to ¾; Gunnislake (Clitters), 1½ to 1¾; Herodsfoot, ¾ to ⅞; Hingston Down, ⅜ to ½; Killifreth, 2⅝ to 2¾; Marke Valley, 1⅛ to 1¼; New West Caradon, ⅜ to ½; North Herodsfoot, ⅛ to ¼; Old Gunnislake, ⅜ to ½; Phœnix United, 3 to 3⅛; Prince of Wales, ⅜ to ½; Pedn-an-drea, 1¾ to 2; South Caradon, 24 to 25; South Condurrow, 8¾ to 9; South Crofty, 8⅛ to 9; South Devon United, ⅜ to ½; South Frances, 7¾ to 8; Tincroft, 8½ to 8⅝; West Basset, 5¾ to 6; West Caradon, ⅞ to 1; West Kitty, 14 to 14¼; West Mary Ann, 1 to 1⅛; West Peevor, 4¼ to 4⅜; West Phœnix, ⅜ to ¾; Wheal Agar, 15⅛ to 15¾; Wheal Basset, 5¾ to 6; Wheal Crebor, 1¾ to 1⅞; Wheal Grenville, 6¼ to 7; Wheal Hony and Trelawny, 1⅞ to 1⅛; Wheal Kitty, 1¾ to 1⅞; Wheal Peevor, 3¼ to 3¾; Wheal Uny, 4¼ to 4½; St. Just United, 6½ to 7.

— Mr. JOHN CARTER, mine sharedealer, Camborne (May 3), writes:—There has been rather a better tone in the market during the week, and prices of Carn Brea, Dolcoath, East Pool, Killifreth, and West Kitty advanced, but do not close at their best. At Dolcoath meeting to-day the resolutions passed at the last meeting were confirmed. Subjoined are the quotations:—Carn Brea, 6¾ to 6⅝; Cook's Kitchen, 27 to 28; Dolcoath, 62½ to 63½; East Pool, 45 to 45½; Killifreth, 2*l.* 13s. to 2*l.* 15s.; New Cook's Kitchen, 5 to 5½; New Kitty, 2 to 2¼; Pedn-an-drea, 1½ to 1⅝; South Condurrow, 8½ to 9; South Crofty, 7⅝ to 8; Tincroft, 8¾ to 8¾; West Basset, 5 to 5½; West Frances, 3 to 3½; West Kitty, 13¾ to 14; West Peevor, 5 to 5½; West Poldice, 1¼ to 1⅜; West Seton, 14 to 15; Wheal Agar, 14½ to 15; Wheal Basset, 5⅛ to 6; Wheal Grenville, 6¼ to 6½; Wheal Kitty, 1½ to 1¾; Wheal Peevor, 3¾ to 4; Wheal Uny, 3⅞ to 4; South Frances, 7⅞ to 8⅛.

MANCHESTER.—Messrs. JOSEPH R. and W. P. BAINES, share-brokers, Queen's Chambers, Market-street (May 3) write:—The past week has produced no change for the better as regards the amount of business in progress, a very meagre number of transactions being reported. Quietness rules throughout the markets, and after taking into account the usual 1st of May holiday, the aggregate of dealings is poor. Railway traffic returns are not such as to inspire much hope; and probably the coldness of the season is not without its effect in assisting the sluggish tone. Foreign stocks are irregular, and excepting Egypt Unified, which, after deducting dividend, show a fall of ⅝ to ¾, the movements are unworthy of notice. Mexican rails quote 1¼ to 1¾ lower, a good portion of the decline occurring to-day. Prices on general balance are lower, but only in individual instances decidedly so. Bank shares and telegraph shares alone show any strength.

BANKS maintain their position well, no falling off in values being to be noted. The quotation for Bank of Liverpool is quoted somewhat easier, but it arises from their being now "ex new." Consolidated Bank show an increase in sellers' demands of 1⅛, buyers' quotations standing unaltered. Lancashire and Yorkshire are further advanced ¼, and Manchester and Salford and Union Banks of Manchester are each ½ higher.

INSURANCE.—Business almost *nil* (though not quite so small as during some recent weeks), and a decided preponderance of adverse changes in quotations. British and Foreign Marines are ¼ higher, and Lancashire and Yorkshire Accident show some strength by buyers figures being put up ½, but on the other hand Lancashire are ¼; Royal (Liverpool), ¼; Manchester Underwriters, 1⅛ to 1¼; Queen, 1½; and Thames and Mersey Marine, 1½ lower.

COAL, IRON, &C., AND MINING.—Here also dealings have been very straggling, and amount to a very small total, whilst prices in the great majority of alterations is adverse. Bolckows, with only a solitary transaction each on the fully-paid and 12*l.* paid issues, are again quoted lower. Ebbw Vales neglected, and lower. The recent spring in the price of Llynvi and Tondu Preference has given place to a decline of ⅛, in which also the ordinary issue have joined to a like extent. Tharsis are distinctly quoted, being now ex dividend. Higher—Tharsis Sulphur and Copper, 1⅝ to 1¾; and Cammells, ⅛. Lower—Ashbury's Railway Carriage and Iron, 1; John Brown and Co., 1; Bolckow's fully-paid, ⅛ to ⅜; ditto, 12*l.* paid, ¼; Telegraph Construction and Maintenance, ⅛; Tredegar Coal, &c., A, ¾; Indian Phœnix Gold, ⅛; Ebbw Vale Steel, &c., ⅛ to ¼; Llynvi and Tondu Ordinary, ⅛; ditto, Preference, ⅛; and West Cumberland Steel, &c., 1⅛ to 1¼.

COTTON SPINNING AND MANUFACTURING.—The market continues steady without much difference in figures ruling, and a moderate number of dealings has resulted.

TELEGRAPHS.—Prices where any alteration has been made are all better; but very little business is reported here. Anglo-American Preferred are ½; ditto, Deferred, ¼; and ditto, Ordinary, ¾; Globe Ordinary, ⅜ to ½; ditto, Preferred, ¼; and Direct United States Cable, ⅛ higher.—— TELEPHONES.—A further decline is marked in Unitedś (of ⅛), but in Lancashire and Cheshires an advance of 1s. 6d. per share has been made, which, however, has been reduced by 6d. to-day, leaving the balance of fluctuation a rise of 1s. on the week.

CANALS.—Some movements have ocurred in Bridgwaters, but compared with figures quoted last week only the Preference show a quotable change—a decline of 1⅛. Beyond this there is nothing to record herein. —— CORPORATION STOCKS, &C. are unchanged and quite firm.

MISCELLANEOUS.—A small fall is marked in Anglo-American (Brush) Electric Lights, compared with last week, a decline of 1⅛ being marked. Hudson's Bay quiet, but turned better. Household Stores have further risen ½. Rylands and Sons, though with no pressure of sellers, are easier, and buyers' quotation has been put down ⅛, still there are buyers at slightly above buyers' public quotation.

RAILWAYS.—There has been no hopeful sign during the past week, and prices are as a result further reduced. Traffics do not impart any strength to the market, but it is reasonable to expect that ere long trade will show renewed activity, and more cheering returns be forthcoming. Canadians suffer heavily when the public look for large takings and are disappointed, as selling follows, and prices fall. This has been the case to-day, and all close rather heavy. Americans are upset, and the irregular movements in New York cause weakness at this side. The uneasiness is enhanced by a rumour of a war of rates also discouraging operators here. The Pennsylvania dividend of $1 in cash and $1 in scrip is a sore disappointment to late investors, and a heavy reduction is marked.

SCOTCH MINING AND INDUSTRIAL COMPANIES SHARE MARKETS.

STIRLING.—Mr. J. GRANT MACLEAN, sharebroker and ironbroker (May 3), writes:—During the past week the markets have been very quiet. Trade reports are also dull, although the prospects cannot be considered unfavourable.

In shares of coal, iron, and steel companies the principal alteration is an advance on Steel Company of Scotland shares. Barrow Steel are at 11 to 11⅛; Llynvi and Tondu (preference), 69s. 6d.; Mwyndy Iron, 15s. to 17s. 6d.

In shares of foreign copper and lead concerns there has been less business doing, but prices are steady. Tharsis improved from 33*l.* 10s. to 35*l.* 6s. 3d., but have since given way a little. Santa Cruz are at 2s. to 3s.; Senteins, 10s. to 15s.; and Yorke Peninsula, 3s. 9d. to 5s.

In shares of home mines Blue Hills are at 10s. to 15s.; Carn Cambornes, 22s. 6d. to 27s. 6d.; Devon Friendships, 6s. to 7s.; Penhalls, 10s. to 12s. 6d.; Parkas, 5s. to 7s. 6d.; Pedn-an-drea, 27s. 6d. to 32s. 6d.; South Penstruthal, 30s. to 35s.; South D'Eresby, 2s. 6d.; Silver Hills, 2s. 6d. to 5s.; Tamars, 10s. to 15s.; Van Consols, 10s.; West Phœnix, 18s. 9d.; Wheal Basset, 5¾; Wheal Lusky, 2s. 6d.; and Yeoland Consols, 7s. 6d. to 10s.

In shares of gold and silver mines prices are steady, and in some cases inclined to improve. Mysore Reefs, 2s.; New Gold Run, 4s. 3d.; New Callao, 9s. to 11s.; Ooregum, 5s. to 7s. 6d.; Silver Peak, 2s. to 3s.; West Callao, 2s. prem.

In shares of oil and miscellaneous companies prices are generally steady. Oil companies' shares are firm, owing to the satisfactory dividends announced. The Broxburn Company has declared a dividend of 25 per cent. per annum; Uphall, 3½; Oakbank, 11 per cent.; and Clippers are expected to give 5 per cent., while the Burntisland Company is expected to give as much as 24 per cent., after allowing for depreciation, the large dividend in the last-named case being attributed to the enormous percentage of paraffin scale they have obtained from the crude. Lawes' Chemical, 5¾ to 6¼; Newcastle Chemicals, 20s. to 25s.; Noble's Explosives have declined from 30½ to 28⅝.

EDINBURGH.—Messrs. THOMAS MILLER and SONS, stock and share brokers, Princes-street (May 3), write:—The markets for home railways, Canadians, and Americans have continued dull since last report. In Arizona Copper shares there have been heavy fluctuations. Since Wednesday last week Caledonian has gone from 106¾ to 105⅞; Great North from 56¼ to 55⅞; North British from 101¼ to 101, Grand Trunk Third Preference from 49½ to 49. In mines, Arizonas, after constant fluctuations, stand at the same price at which they stood a week ago, 99s. 6d. Rio Tintos have declined from 23½ to 23⅛. Burntisland Oil have receded from 22 to 21¾; Midlothian from 10⅜ to 10⅝; Young's from 13 to 12⅞.

IRISH MINING AND MISCELLANEOUS COMPANIES SHARE MARKET.

CORK.—Messrs. J. H. CARROLL and SONS, stock and share brokers, South Mall (May 2), write:—Great Southerns changed hands at 121⅛ to-day and Midlands at 89¾. Northerns steady at 122, and Passage changed hands at 9½. Nothing done in Bandons or Macrooms. National Banks were 24 11-16ths and Provincial 32½. Munsters were also done at 7, Alliance Gas at 17¼, and Cork Gas at 9¼. Steam Packets, buyers, at 11, and Brewery at 5. Lyons remain 5¼, and Daly 2¼. Gresham Hotels were offered at 3¼, Gouldings at 9, and Levys about 6.

LAKE SUPERIOR COPPER MINING AND ITS PROSPECTS.—The Calumet and Hecla produced during March 1873 tons of 80 per cent. manual, or nearly 1500 tons of ingot copper. As you will have noticed by New York papers the production of copper is now got beyond the requirements of home consumption. The development of the western mines has led to this, and either an outlet on foreign markets has to be found or somebody must go out of the business. The fall in the price of ingot, writes a local correspondent, seriously affects Lake Superior, outside of one or two mines, but in the near future must come a general settling of values, and wages more nearly approximating outside rates will prevail. I do not mean that this will be effected wholly in a short time, but the indications show that it must come. Over production in almost every line of business is the rule, and as you know this inevitably leads in one direction. The development of India as a wheat growing country will also have its effect on values in this country. The west is absorbing crowds of people yet, and wheat growing is their principal business. Cheap lands requiring but little cultivation, and the presence of the locomotive, admitting of rapid and cheap transit, and a hungry market in Europe, have all combined to make farming desirable and lucrative. But if Europe gets supplies of grain elsewhere then a glut will be felt in the home market, and to enable the farmer to live and prospgr fairly prices must come down in all directions. Disturbing factors seem to arise in every direction. The mining future of Cornwall and of England, outside of coal and iron, is certainly very much mixed, and early action on the dues question should be taken. If tin goes up its development to a great extent may be looked for in Australia, and I anticipate news of important tin discoveries in Mexico. Every help should be lent the miner to stand his ground, for the market once lost will be hard to control again.

PATENT DETACHABLE ELEVATOR CHAINS FOR MINES, &c.—Mr. C. G. Hall, of Shefficld, has brought his closed detachable elevator chain to a high state of perfection, as it can be made to work in any position from a vertical line to an angle of 30°. The chains are made to lift up to 500 tons per day, and the bucket is secured to the link by one countersunk headed bolt and two projecting pieces, which slide into similar projections in the bucket or other attachment, which are undercut. Every link is precisely the same, there being no special links to secure the bucket scraper or other attachment to; but any and every link may be used to secure such attachment to—a feature not possessed by other ordinary chains. The chain fits flat on the sides of the drums and does not depend upon teeth alone for its driving power. Every link being interchangeable there is greater facility for securing buckets or other attachments, and only one bolt is required to secure the attachments, although it is held at three places by the link being equal to having three bolts through it. Several of the chains are now in use in various mining districts drawing from them from 10 tons to 300 tons per day of both small and large material. The chain has also been adopted at the Chatham Defence Works, as well as at several of the largest and best-appointed mines in different parts of the kingdom. Mr. Hall states that the principle of coupling has been extended to improved forms of creepers, carriers, dredger chains, &c., and as wants are developed its uses will be greatly multiplied. It is made of best annealed cast-steel for heavy work, and stamped wrought-iron and malleable cast-iron for the lighter sizes. It has already been largely exported and is generally and admittedly found to be a considerable advance upon any chain previously introduced, the steel pin and hook affording great durability and strength, and the links' centre made of stamped wrought-iron, malleable iron, or steel.

* * The TITLE-PAGE and INDEX to VOLUME LII., for the year 1883 was published in the *Mining Journal* of Jan 20.

THE MINERAL RESOURCES OF COLORADO.

As a producer of the precious metals Colorado, three years ago, by virtue of the largest returns, assumed the headship of the mining states of the world, and has maintained that position to the present time. Such is the gratifying announcement with which Mr. J. Alden Smith, the State Geologist, is enabled to commence his Report of the Development of the Mineral, Metallurgical, Agricultural, Pastoral, and other Resources of Colorado for the years 1881 and 1882 (London: Trübner and Co., Ludgate Hill), and the details which he gives in the volume fully justifies his encouraging opening. For the past two years something over one-half of the total lead product of the United States has been taken from the mines of Colorado, and to-day mining is considered to be established as a permanent and steadily profitable industry, which will endure for ages with, it is believed, constantly increasing yields. The field is very large, embracing nearly all the mountain ranges, and extremely inviting alike to the capitalist, the artisan, the miner, and the common labourer. Beginning with the discovery of gold in Gilpin County 23 years ago, which drew vast numbers from all the Western States to search for hidden treasure, the development was for a considerable period wholly crude and spasmodic, confined almost entirely to the rapid exhaustion of the more valuable deposits found at the surface here and there in the various mineral belts, where the decomposed outcroppings gave promise of immediate rewards to unskilled efforts, and to the gulches and placer grounds. The earliest settlers and the few who followed them up to the year 1865 came for gold only, with no expectation of being called to solve the deeper ploblems of lode mining and metallurgy. The areas containing gold were very nearly as well known then as now, the sections from which present supplies are drawn having been very thoroughly prospected by the pioneers. The tracts bearing free gold being extremely limited, and each crowded at the outset by hordes of men impatient to dig out their fortunes as soon as possible, the interest excited by the realisation of heavy gains subsided by degrees with the gradual decrease of earnings, when the crowds emigrated to other fields, leaving the further development of the country to the few whose pluck and faith seemed equal to the task. The small amount of solid wealth accumulated meanwhile was due rather to hard work and the closest economy than to the productiveness of the resources under operation. Legitimate exploitations of the fissure veins which constituted the principal sources of production proceeded slowly, because of the universal ignorance of the perfected methods of mining and the reduction of refractory ores. Science and skilled labour had not then filled the land with potent aids for the proper extraction of ores and their precious contents. Consequently, underground work was unskilfully prosecuted and unfairly rewarded. The mineral broken by hard struggling with adverse conditions, however rich in gold or silver, returned meagre profits to the producer, because no one had applied the better knowledge of milling or smelting employed with powerful effect in the older mining states and territories.

The introduction of railways in 1870 produced that change which subsequently wrought momentous changes in the new West. The Union Pacific did more harm than good to Colorado, but it was speedily followed by the Denver Pacific, Kansas Pacific, Colorado Central, Boulder Valley, Denver and Rio Grande (1400 miles of roads 3 ft. gauge), Denver and South Park; Atchison, Topeka, and Santa Fé; Denver and New Orleans; Denver, Utah, and Pacific; the Burlington and Missouri, and others which have given the State railway facilities ample for all its present requirements. The details which Mr. Smith gives of interest to miners are of course very numerous, and many of his observations are highly suggestive. Referring to the mines of Boulder County he states that they are at present in quite as healthy a condition as they have been at any time within the past ten years. They are very generally operated for actual profits rather than for the purpose of creating a fictitious value for the stocks of the various companies. The "new process" craze has had, and is still having, a very extended influence, greatly to the detriment of the county's development at home and of its reputation abroad. Within two years several mills have been erected at a cost of hundreds of thousands, containing "processes," the principles of which were tested and condemned many years ago, and if the parties who furnished the capital for these enterprises (it is assumed that no one familiar with metallurgical science would have embarked in them) had consulted metallurgists of ability and integrity, they would have saved themselves much annoyance and expense, and the country would have escaped much ridicule and consequent loss of prestige. While the failure of these schemes has not injured the mines they have, nevertheless, prejudiced capital against the districts where they are located, because the want of success is almost universally charged to the refractoriness of the ores or to their poverty rather than to the true causes.

Several excellent mills, constructed upon correct principles, have been established in localities where high grade ores are abundant, but where it was impossible for the owners to obtain all the varieties necessary to form self-fluxing mixtures. These errors, to give them no harsher name, have seriously retarded progress here and elsewhere. These monuments of folly standing in the form of deserted and decaying mills and smelting furnaces, may be seen in all the mining counties, from Boulder to the distant San Juan, representing the darkness of ignorance and millions of capital wantonly squandered. Referring to improvements in methods of reduction, Mr. Smith remarks that while no radical changes have been made in any department of reduction during the past 20 years many improvements have followed the suggestions of experience from year to year in the form of mechanical devices and chemical appliances. As to crushing operations he says that for breaking hard rock and ore to the size of walnuts the Blake jaw crusher is generally conceded to be the most efficient machine used in Colorado. The Dodge (new patent) and Alden inventions, however, do very effective work. Next in order, for reducing to the size of corn, are Cornish rolls. Following the jaw crushers, the rolls are employed for sampling in all the larger establishments, because, for this purpose, they are the best yet introduced in Colorado. For pulverising the stamp-mill though heavy and cumbersome has stood the test of many generations, and for effectiveness and economy in fine pulverising it is unequalled. Many inventions have attempted to supplant it, but unsuccessfully. It would be rash to say that it will not be superseded, but until something decidedly better shall be brought forward through all the experimental stages to a higher perfection, it will retain its position and prestige in all the mining districts where the ores are adapted to that method of treatment.

Though vast efforts supported by abundant capital has been expended on the intricate problem of concentration it has not been fully solved. While many new devices have been introduced from time to time none have met all the requirements of the districts where located. He cannot discover that any remarkable advance upon the old-established forms of concentrating machinery have been made, either in this country or in Europe. The object in view is the economical utilization of the low grade material which forms so large a part of the product of all mines, and which in its native state has no commercial value. While this has been accomplished to a limited extent, the inventions of later times have not materially changed the results attained 50 years ago. For concentrating the finely pulverised residuum of stamp-mills the Cornish nicking buddle, and a peculiar form of rocker, have proven most economical and effective, when the cost of the plant, expense of operation, and relative percentage of saving are considered. Mills have been erected in different quarters of the State expressly for concentrating ores, but with few exceptions were closed in a few weeks after completion, or operated spasmodically without satisfactory results. The causes of failure in some cases is directly attributable to ignorance of the essential principles involved; others to machinery calculated to work in direct opposition to natural laws. Still others had approved machinery, but of a capacity too limited for profitable conduct. Some were placed where there was no adequate supply of suitable ores, and many where the concentrates, when perfectly cleansed, were of too low a grade for existing markets. The Harz jigs and slime tables, Collom jigs, Rittinger tables, Krom dry jigs, Frue vanners, Rouse tables, &c., have all been subjected to crucial tests in their mining districts. Though each possesses more or less merit, not one is perfect, and few, if any, except the buddles and rockers, have been continuously and profitably operated. In some cases too much benefit is expected from concentration; in the majority the mills fail from the want of practical knowledge on the part of the managers.

But, perhaps, the most interesting sections of Mr. Smith's report is his reference to the coal and iron mines, and to the petroleum existing in the State. With regard to COAL he states that many extravagant estimates of the area containing coal have been made, some placing it at 50,000 square miles; but deducting barren ground caused by faultings from various causes, together with that erroneously classed as coal land, he is convinced that they are much too high. That we have an immense territory filled with valuable fuels is undeniable, but its entirety cannot be even approximately ascertained until developed by the prospectors of future generations. Several discoveries have occurred during the past two years, and the yield has been very largely augmented in that time. The greater portion is a superior lignite, but numerous tracts, as will be hereafter defined, contain the denser bituminous and the anthracite varieties. The lignites are universally conceded to excel those of most other countries. They are exceedingly dense, generally jet black, with high lustre and, as a rule, wholly destitute of fibrous or woody structure; specific gravity from 1·28 to 1·40, averaging about 1·33; rarely contain 1 per cent. of sulphur, and usually less than 0·4 per cent.; ash residue comparatively slight, ranging between 2 and 7 per cent., averaging about 4½; heating power high, igniting readily, burning freely until the last fragment is consumed; are in general use for domestic purposes, roasting pyritous ores, for making steam in stationary and locomotive boilers, blacksmithing, the burning of lime, and, to a limited extent for smelting, and the production of illuminating gas. The age in which the different varieties of coal found here were deposited or formed, is still a matter of contention among geologists, some asserting the tertiary, others with perhaps equally good reasons that they are of cretaceous origin. My own view of it is the north-eastern fields are tertiary, and those in the south-western part of the State partially, if not wholly, of the post-cretaceous period. Quite recently beds of lignite were discovered in Routt County, near the Utah line, believed to be of carboniferous age, but as he has not examined them he is unable to determine. It is beyond dispute, however, that carboniferous rocks exist in that region. The lignite deposits whence domestic supplies are chiefly drawn lie in the northern fields. The principal veins are from 5 ft. to 16 ft. thick, averaging 8 ft. to 9 ft. The product of this region last year was about 310,000 tons. The Larnner and Grand counties deposits supply home demands, but from lack of railway facilities have not been further developed.

The coal found in El Paso, Park, and Fremont is of good quality, but slacks rapidly by exposure. But one mine (near Franceville) has been opened, and yielded in six or eight months about 24,000 tons. The Cuchara fields are situated near Walsenburg, in Huerfano County. Of the three veins discovered, but one has been developed. This is 7 ft. thick; the coal similar to that of the Canyon mines, affording an excellent fuel for steam and domestic uses. Its capacity is said to be 700 tons per diem, and it has produced 96,200 tons in the past year. Mr. Smith has not examined the deposits of La Plata County, but they are pronounced by competent authority to be among the largest and most valuable thus far discovered in the West. They are located near the town of Durango. He is informed, from trustworthy sources, that the Durango vein is 13 ft. thick, the Railroad and Peacock 75 ft., and the California 110 ft.; also that much of it produces a fine quality of coke. A few narrower veins have been opened near Rico, in Dolores County, and others prospected. These carry from 2 to 7 ft. of marketable coal of excellent quality, from which fine specimens of coke have been exhibited. For home consumption only some 2000 tons have been extracted. There are strong indications of large deposits in Conejos County, but they have not been developed. The same is true of Rio Grande, Costilla, Saguache, and Ouray. The entire production of coal in Colorado for 1882, as nearly as can be ascertained, was 1,588,000 tons, of the average value of 9s. per ton at the mines.

Although there are abundant proofs of the existence of PETROLEUM at many points in the State, in oil and bitumen springs, and through the small quantities obtained by boring, no large reservoir has been opened. Those which have attracted greatest attention are situated on Oil Creek, 6 miles north of Canyon city, from which considerable oil has been taken by skimming the brackish water at the surface which rises with it. In the crude state it is heavy and impure, containing about 50 per cent. of heavy oil, 12 per cent. of benzine, with much paraffin, and paraffin oil, and about 15 per cent. of coke and useless matter. Some years ago a well was bored near these springs to a depth of 85 ft., which produced a little oil. It is considered probable that extensive reservoirs may be found within 10 miles of Canyon city, and also in the great bituminous coal basin near Trinidad, by deeper borings. It is likewise probable that they may be found in the Gunnison fields near Crested Butte. The existence of oil springs has been established near Morrison, 15 miles from Denver; near Bitter Water Fork, on Grand River, below the old White River Agency; on a tributary of Bear River, about 100 miles north-east of the hot sulphur springs in Middle Park; and at several other points. It is not improbable that borings intelligently directed would penetrate large reservoirs in one or more of these sections, and thus add another important feature to the already numerous developed resources of the State.

Accompanying and contiguous to the coal mines, as well as independently at many other points, both in the mountains, parks, and on the plains, in nearly every section of the State, vast deposits of IRON ORE of good quality have been discovered, comprising nearly all known varieties, but until the past two years very little attention has been given to this branch of industry. The Colorado Coal and Iron Company produced 511,239 tons of coal, 92,770 tons of coke, 53,425 tons of iron ore, and 88,375 tons of iron and steel. The first rail was rolled by this company on April 12, 1882, and the nail-mill was started Sept. 15 following. It is confidently expected that their operations will be at least doubled within the next year. The building stone, marbles, and allied industries have within the past few years assumed considerable proportions through the constant demands of Denver builders and those of neighbouring towns. This has resulted in the discovery and development of many quarries containing the different varieties of stone in all quarters of the State. Granite, lava, trachytic rocks, lime and sand stones, &c., are found in limitless abundance. Marbles of many varieties and of very good quality are found along the bases and slopes of the mountain ranges. A beautiful species of breccia occurs in Boulder County, and one extensive deposit of white marble was recently opened in Chaffee County. Apple green and clouded of fine texture, susceptible of high polish, and very desirable for mantles and other household ornamentations, occur in Park County. Immense beds are said to exist near the head of Rock Creek, in Gunnison County. It is described as a clouded marble in all colours, and forming superior building material. No special effort has been made to utilise any of these valuable deposits, but the time is near when they will become prominent features in the industrial forces of the State.

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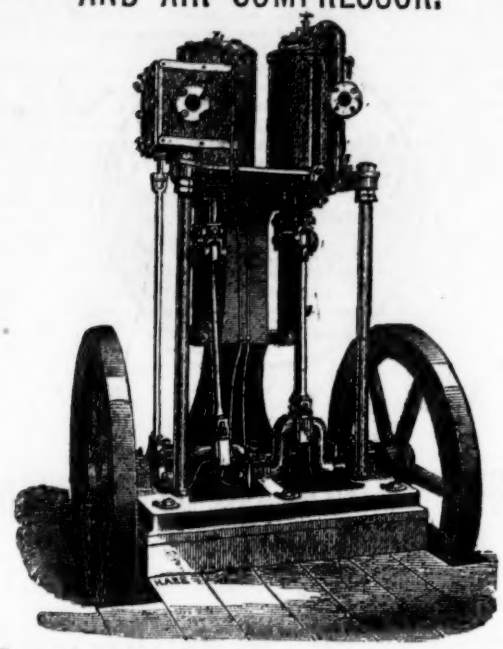

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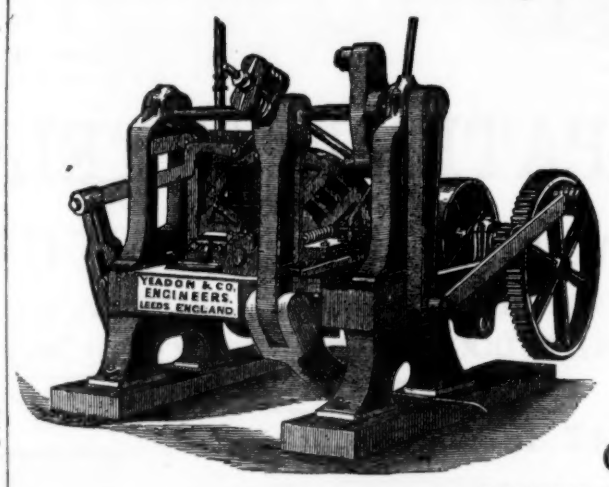

GREAT SAVING NO WASTE COAL.

NO COLLIERY SHOULD BE WITHOUT.

These Machines utilise small coal or coke by making it into Briquettes or blocks compressed fuel at the rate of 36,000 per day The cost of preparing, mixing, and making is under One Shilling per ton. The Briquettes sell readily for Locomotives, Household, or other purposes. Full particulars on application to

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ENGINEERS AND CONTRACTORS

FOR EVERY DESCRIPTION OF PLANT FOR

Collieries, Mines, and Brickworks,

TESTIMONIALS

Messrs. Yeadon and Co, Lee HARBONNAGE DE BERNISSART, PRES PERUWELZ (BELGIUM), JANUARY 4TH, 1878.
I continue to be **perfectly satisfied** with the work performed by the two patent Briquette Machines as well as with that of the Steam Engine, Mixer, &c., which you supplied a few months ago for the manufacture of compressed slack Briquettes, and that I can recommend them as being the **best machines** I know of, after having carefully studied **all the Briquette Machines** constructed at home and abroad. G. FAGES, General Manager.

SOCIETE DES CHARBONNAGES REUNIS DU RIEU DU CŒUR ET DE LA BOULE. QUAREGNON (BELGIUM), SEPEMBER 13TH, 1879
Messrs. Yeadon and Co., Leeds.
We are **entirely satisfied** with the erection and working of the two Briquette Machines, as well as the Steam Engine and Mixing Apparatus. A. FRANEAU, Managing Director.

Messrs. Yeadon and Co., Leeds. CHARBONNAGE DE BERNISSART, PRES PERUWELZ, JANUARY 24TH, 1879
I continue to be highly satisfied with the Briquette Machines which you supplied in 1877. They do their work very well, and produce the Briquettes very regularly, and of a good quality. G. FAGES, General Manager.

Messrs. Yeadon and Co. SOCIETE HOUILLERE DE VENDIN-LEX-BETHUNE, PAS-DE-CALAIS, DECEMBER 2ND, 1880.
I have the honour to inform you that the Briquette Machines **work very well.** The Briquettes are **very well made.** I am highly satisfied with your workmen, who have done their work very well. SYLVA CATTIER, General Manager.

The undersigned, Civil Engineer of Mines, Chevalier of the Legion of Honor, Consulting Engineer fo the Mines de Vendin-lezto, Bethune, Pas-de-Calais, certifies that the Briquette Machinery for making Briquettes of Coal, supplied by Messrs. Yeadon and Co. to the above Company **is working to their entire satisfaction.** E. LISBET.
Lille, December 28, 1880.

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This unrivalled Explosive, as manufactured by the **New and Perfected Machinery** of the Company, is perfectly safe for transit, storage, and use, and is employed in every description of Mining or Quarrying Work, for Tunnelling, Pit Sinking, Engineering Work, and Submarine Operations, with the most complete success and satisfaction.

Potentite does NOT contain its own MEANS OF IGNITION, is free from Nitro-Glycerine, and its SAFETY has been specially demonstrated by public experiments.

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In action it gives off neither flame, smoke, nor offensive smell By its use labour is economised, as work can be resumed immediately after the shot is fired.

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